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NORTH AMERICAN HERPETOLOGY;

OR,

A DESCRIPTION

OF THE

REPTILES INHABITING THE UNITED STATES.

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P R E F A C E .

IN publishing a second volume of the NORTH AMERICAN HERPETOLOGY, I would offer my thanks to those gentlemen who have lent me their assistance.

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JOHN EDWARDS HOLBROOK.

Medical College, Charleston, South Carolina, 1842.

NORTH AMERICAN HERPETOLOGY

ORDER I. CHELONIA.—CONTINUED.

FAMILY III. POTAMITES.* *Dumeril et Bibron.*

CHARACTERS.

1. The bony carapace is greatly depressed, covered with skin instead of horny plates, which is more extensive than the ribs, and thickest and movable at their external extremities.
2. The sternum is short, and truncated behind, but longer than the carapace before, and is nowhere joined to it by symphysis.
3. The head is small, elongated, narrow, and covered above, as well as at the sides, with skin.
4. The nostrils are tubular, closely approximated, and open in front, at the extremity of a short, fleshy, movable appendix.

* Ποτάμιος, Ποταμός: fluvialis, amnicus.

5. The eyes are prominent, near each other, and are directed forwards and a little upwards.
6. The jaws are strong, with their cutting margins nearly naked, being covered externally only by a thick revolute fold of skin resembling lips.
7. The neck is very long and retractile.
8. The extremities are very short, thick, and depressed; there are five fingers and as many toes, but only three nails to each extremity, and these are nearly straight and slightly grooved below.



Trionyx ferox

F.S. David Lith. Phila

TRIONYX.—*Geoffroy de St. Hilaire.*

Genus **TRIONYX.**—**CHARACTERS.** Carapace with an osseous disk in the centre, from the sides of which project bony tubercles or ribs; beyond these the margin is cartilaginous, flexible; mandibles furnished with thick lips at the sides; snout prolonged; anterior extremities with five fingers, palmate, the three internal furnished with nails; posterior, with five toes, palmate, the three internal with nails.

TRIONYX FEROX.—*Schneider.*

Plate I.

CHARACTERS. Head elongated, oval; snout greatly prolonged; neck very long; body covered above with a strong cartilaginous shield, entire, with numerous short spines or tubercles on the anterior margin, and several knobs near the posterior border; above, umber coloured, with irregular dusky blotches; abdomen beautiful white, and marked with numerous red blood-vessels; anterior extremities with five palmated fingers, the three anterior only furnished with nails; posterior with five toes fully palmated, the three internal with nails.

SYNONYMES. Soft-shelled Turtle, *Pennant*, Phil. Trans. for 1771, vol. lxi. p. 268, pl. x. figs. 1, 2, 3.

Testudo ferox, *Schneider*, Schildk., p. 330.

Testudo ferox, *Gmelin*, Syst. Nat. Lin., tom. i. part iii. p. 1039.

Soft-shelled Turtle, *Bartram*, Travels in Carolina, &c., p. 177.

La molle, *Lactépède*, Quad. Ovip., tom. i. p. 136, not the figure.

- Testudo ferox, *Schoepff*, Hist. Test., p. 88, f. xix.
- Testudo verrucosa Bartrami, *Schoepff*, Loc. Cit., p. 90.
- Testudo ferox, *Latreille*, Hist. Nat. Rept., tom. i. p. 165.
- La tortue de Pennant, *Daudin*, Hist. Nat. des Rept., tom. ii. p. 69.
- Testudo Bartrami, *Daudin*, Loc. Cit., p. 74.
- Testudo ferox, *Shaw*, Gen. Zool., vol. iii. part i. p. 64, pl. xvii. fig. 1.
- Trionyx Georgicus, *Geoffroy*, Ann. Mus., tom. xiv. p. 7.
- Trionyx Bartrami, *Geoffroy*, Loc. Cit., p. 18.
- Trionyx ferox, *Schweigger*, Arch. Königsb., vol. i. p. 285.
- Trionyx ferox, *Merrem*, Versuch. eines Syst. der Amphib., p. 20.
- Trionyx ferox, *Say*, Jour. Acad. Nat. Scien. Philad., vol. ii. p. 203.
- Trionyx spiniferus, *Lesueur*, Mem. du Mus., tom. xv. p. 258, pl. vi. figs. a, b.
- Testudo ferox, *Leconte*, Ann. Lyc. Nat. Hist. N. Y., vol. iii. p. 93.
- Aspedonectes ferox, *Wagler*, Natürlich. Syst. der Amphib., p. 134.
- Trionyx ferox, *Gray*, Synops. Rept., p. 43.
- Trionyx ferox, *Harlan*, Med. and Phys. Res., p. 158.
- Gymnopus spiniferus, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. ii. p. 477, pl. xxii. fig. 1.
- Soft-shelled Tortoise, or Soft-shelled Turtle, *Fulgo*.

DESCRIPTION. The shell is sub-oval, larger behind, entire, ecarinate, greatly depressed, and smooth above, except where some tubercles are situated on its posterior soft portion. These tubercles are small, disposed in rows, and reach from the margin to the circumference of the bony disk. At the anterior border are seen a number of pointed or conical tubercles; many of them are almost horny at the tip.

The sternum is oval, entire, and full in front, extending even beyond the carapace; its anterior part is cartilaginous and movable, and can be drawn upwards at the will of the animal, so as to touch the carapace, and thus conceal the head when retracted. Posteriorly the sternum is also entire, but smaller, and much less extensive, leaving the extremities completely exposed.

The head is large, elongated, oval, with the forehead considerably elevated, and

the snout small, cylindrical, and greatly prolonged. The nostrils are anterior and closely approximated; they are sub-round, the greatest extent being in the vertical direction, and their long axes are parallel to each other. The eyes are large, prominent, and very closely approximated; the pupil is black, the iris of pale lemon colour, very brilliant, and marked with an interrupted longitudinal black band. The mouth is large, naked in front, but with large, revolute, movable, thick lips at the sides, both above and below. The jaws are entire, or without serræ, and the lower is received within the upper.

The anterior extremities are large, flattened, and covered at the fore-arm with three broad scales placed transversely; there are five fingers, extensively palmated, but the three anterior alone are furnished with nails, the two posterior are far apart, and seem useful only in supporting the web. The posterior extremities are equally large, and still more flattened at the tarsus, which sustains five broadly palmated toes, the three anterior furnished with short strong curved nails, a little grooved on their inferior face; the two posterior toes are far apart, and sustain the web, which is here extensive, and continued along the posterior margin of the limb; and further, there is behind the little toe a large oblong piece of cartilage imbedded in the membrane or web, continued along the leg, which must be still more instrumental in keeping it extended. The tail is thick, conical, short, passing but slightly the carapace, and has the vent near the tip.

COLOUR. The shell above is umber coloured, more or less bright, and marked with large irregularly dusky blotches; these are circumscribed in the young, but are spread out with irregular margins in adults, and sometimes they disappear altogether and leave the shell of one uniform colour. The sternum is white, and beautifully marked with waving red lines, caused by the blood-vessels being seen through the transparent skin.

The superior and lateral parts of the head and neck are umber coloured, the lips a little lighter; the inferior surface is dirty white, with a tinge of green. On each side of the head and behind the eye is a yellowish oblong blotch, bordered

with black, which in young individuals is bright, and continued towards the snout, but becomes more and more obscure as the animal increases in age.

The extremities are umber coloured above, the webs tinged with green; below they are white, tinged with green, which latter colour prevails at the webs.

DIMENSIONS. The length of shell in the animal here represented was 16 inches; breadth, 12 inches; length of sternum, $10\frac{1}{2}$ inches; length of head, $2\frac{1}{2}$ inches; breadth, 2 inches; elevation of the animal, 3 inches. They sometimes are found of much greater dimensions.

HABITS. The *Trionyx ferox*, in the native state, is a voracious animal, feeding on fish, or such reptiles as he can secure, and is so greedy that he takes the hook readily when baited with whatever animal substance; yet in confinement, even of several months duration, I have never seen one take sustenance of any kind, though offered a variety of food. In the more southern rivers the Soft-shelled Turtle is said to destroy great numbers of young Alligators, and in turn they are devoured by the old. They reside most constantly in the water, swim with rapidity, and choose for their retreats holes under the banks of rivers, or under rocks; and not unfrequently the trunk of some huge forest tree, fallen into the stream, affords them shelter. Sometimes they leave the water and conceal themselves in the mud; I have frequently seen them thus buried to the depth of two or three inches, leaving only a small breathing hole for the long neck, and narrow head, which it occasionally thrusts out, but most commonly has it retracted so that one would pass near without observing its habitation; and if seen, it might easily be mistaken for the residence of some large insect. At other times they may be seen in numbers on rocks in shallow water, basking in the sun, apparently asleep. In these situations, Dr. Geddings informs me, many are taken, by erecting a slight fence at some distance around them, or by placing other obstructions between them and deep water, to cut off their retreat.

The *Trionyx ferox* bites severely when provoked, darting forward with great

velocity his long neck and head, and not unfrequently springs upward at the same time, and makes a loud hiss.

In the month of May the females seek sandy places along the banks of the waters they inhabit to lay their eggs, generally about sixty in number; and it is remarkable that, though their motions are slow and difficult on dry land, yet at this season they sometimes mount hillocks several feet high.

The eggs once deposited, the female returns to the water, and leaves them to be hatched by the heat of the sun. The eggs, according to Lesueur, who examined them on the Wabash, are spherical, with the shell more brittle than those of the *Emydes* inhabiting the same waters.

Of all the *Cheloniadæ*, the flesh of the *Trionyx ferox* affords the most delicate food, surpassing that even of the Green Turtle.

GEOGRAPHICAL DISTRIBUTION. The *Trionyx ferox* affords an admirable illustration of the influence of physical geography in the distribution of animals. Thus, it inhabits the Savannah as well as all those rivers that empty into the northern borders of the Gulf of Mexico; it ascends up the broad Mississippi, and is found in all its tributaries, even to the very foot of the Rocky Mountains, according to Lewis and Clark; it abounds in the chain of great northern lakes both above and below the Falls of Niagara; and is "common" in the Mohawk, a tributary of the Hudson river; but is not found in any other Atlantic stream between that and the Savannah river, a distance of nearly eight hundred miles. Now a glance at the map of the United States will show us how this tortoise, doubtless originally a western species, and never migrating by land, can have passed by *water* from the Great Valley of the Mississippi to the northern lakes, and to the Mohawk and even Hudson river. At the source of St. Peter's river in times of flood there is a free communication with Red river of Lake Winnipeg, (lat. 48°, Say, in Long's Exp. ;) which thus affords a passage for the *Trionyx ferox* to the Lake of the Woods. Again, the Upper Illinois is well known to

communicate with the waters of Lake Michigan in spring floods, so that even loaded boats may pass; and in this way does our animal reach the chain of lakes, that open into the St. Lawrence river. Lastly, previous to the construction of the New York canal, Wood creek, at the head of the Mohawk, also at "spring floods" communicated with the waters of the Oswego river; and consequently there the *Trionyx* could pass to and become "common in the Mohawk," and reach the Hudson, though absent from every other river opening into the Atlantic, between the St. Lawrence on the one hand, and Savannah river on the other.

GENERAL REMARKS. To Dr. Garden is due the merit of having first described the *Trionyx ferox* in a memoir communicated to Pennant, the celebrated English naturalist. This memoir was read before the Royal Society of London in the year 1771, and then published in the sixty-first volume of their Transactions. The description is accurate, and is accompanied by three tolerable drawings done from life, and giving three different views of the animal. How it obtained the specific name of *Ferox*, I cannot determine, unless it might be from its habits as described by Garden—"this animal is very fierce;"—and it is uncertain by whom it was first applied. It was not Pennant who thus named it, for he confined himself simply to the memoir of Dr. Garden—"A New Species of Fresh Water Turtle, commonly called the Soft-shelled Turtle"—and yet most authors refer this name to him.

Twelve years after this, I find Schneider, for the first time, applying the specific name *ferox* to this animal, which seems now to have been consecrated by the general use of all naturalists, with one or two exceptions. Thus Geoffroy in establishing the genus *Trionyx* which has been adopted in this work, reproduces this animal under a new name, *Trionyx georgicus*, though his description is taken from Pennant.

Lesueur next gives an accurate description and drawing of the *Trionyx ferox*, but under the name *Trionyx spiniferus*, from the knobs and spines on the carapace,

in which he is partly excusable, for he thought it might be a new species of Turtle; thus he says "it is possible that this animal (*Trionyx spiniferus*) may be the *Trionyx ferox*, but from its geographical distribution (Wabash river), he doubts it, as he has observed in the United States that even at short distances the same species no longer exist." This is perfectly true as regards the Atlantic states, but much less so of the western, and if the geographical distribution be referred to it, it will readily be seen how widely extended in the west may be a species entirely aquatic.

Dumeril and Bibron have lately adopted the specific name *spiniferus* for this animal, which I cannot retain, as that of *ferox* has the right of priority, having been in general use for nearly fifty years.

They furthermore consider the *Trionyx carinatus* of Geoffroy, and the *Trionyx Brogniartii* of Schweigger, as merely the young of our animal, and the opinion of such excellent herpetologists is worthy of all credit, especially as they affirm that there is still preserved in the Museum of the Garden of Plants at Paris the identical specimens from which those descriptions were taken.

It has always appeared to me that the "great Soft-shelled Turtle" of Bartram, and the *Trionyx ferox* were one and the same animal, for no other species than this has ever been received from Florida, with which country we have now almost daily communication. Leconte lived for a time on the St. John's river, the very place where Bartram found his animal, yet he saw only the *Trionyx ferox*; and several officers of the army, who have been stationed in that country for years, and planters living on the banks of the river, have equally failed in finding the Soft-shelled Turtle with the long warts about the neck. Bartram, though a respectable botanist, was not an accurate zoologist, as his writings clearly enough show—the spines given to the neck are those that properly belong to the carapace, and the five nails represented as belonging to the extremities, are doubtless the result of careless observation—for there are five fingers and as

many toes, all perfectly well developed, and he might easily suppose each one furnished with a nail, unless he took the pains to examine them closely.

Dumeril and Bibron are, I think, mistaken in supposing this animal of Bartram a fictitious one. They say it represents the body and head of a *Trionyx*, but that the feet and cutaneous appendages of the neck were taken from the *Chelys matamata* (*fimbriata*). This can hardly be, for though the *Chelys matamata* is mentioned in Barrère's *Natural History of Guiana*, at that time called "*La France Equinoxiale*," yet the first figure given of it was by Bruguière in "*Le Journal d'Histoire Naturelle de Paris*," for 1792, which is so good a one that it has been repeatedly copied by other naturalists, as Schoepff, &c. Now Bartram's work was published in Philadelphia in 1791, consequently he cannot be accused of this deception. Bartram was an honest, upright, though somewhat over credulous naturalist.

I can adopt neither the generic name *Aspedonectes* of Wagler, nor that of *Gymnopus* of Dumeril; for though it might be necessary to subdivide the genus *Trionyx* to accommodate all the species with soft shells and three nails, yet in that case I would follow the example of Gray and Bell and retain the name *Trionyx* for the typical form, as it has been consecrated by time, and apply the new epithet of *Amyda*, or *Aspedonectes*, to those that vary from it in proportion of parts, &c., as these should be considered as abnormal forms.



Trionyx muticus

TRIONYX MUTICUS.—*Lesueur*.

Plate II.

CHARACTERS. Shell sub-round, cecarinate, entire, and without spines or tubercles.

SYNONYMES. *Trionyx muticus*, *Lesueur*, Mem. du Mus. d'Hist. Nat., tom. xv. p. 263, tab. vii.

Trionyx muticus, *Leconte*, Ann. Lyc. Nat. Hist. N. Y., vol. iii. p. 95.

Trionyx muticus, *Gray*, Synop. Rep., p. 46.

Trionyx muticus, *Harlan*, Med. and Phys. Res., p. 159.

Gymnopus muticus, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. ii. p. 482.

DESCRIPTION. The shell is sub-round, entire, slightly arched, smooth or without spines on its anterior border, and without tubercles on the superior surface either of its anterior or posterior cartilaginous margin.

The sternum is similar in form to that of the *Trionyx ferox*.

The head is oval, less elevated at the forehead than in the last species, with the snout equally prolonged, and the nares at its anterior extremity. The nostrils are, however, very differently disposed, being large, closely approximated, and of an elliptical form, the larger portion below, and the long axes of the ellipses converging from below upwards and forwards. The eyes are near; the pupil black, and the iris of pale lemon colour, with a dusky bar. The jaws are similar to those of the *Trionyx ferox*, but more pointed and narrow; the lips are more developed, and the mouth larger in proportion.

The anterior extremities are short, thick, flattened, and have several scales at

the fore-arm; the fingers are five in number, fully palmate, the three anterior alone provided with nails. The posterior extremities are short, flat, especially at the tarsus, which sustains five toes, fully palmate, the web even reaching along the posterior margin of the leg; the three anterior toes only are provided with nails; the two posterior extend the web; behind the little toe is seen a large scale. The tail is still shorter than in the *Trionyx ferox*; it seldom passes beyond the disk, and has the anus at the tip.

COLOUR. The whole superior surface of the head, neck and extremities of the animal is light umber coloured, marked here and there with numerous minute and irregular dark spots.

The sternum is white, with reddish lines, caused by the blood-vessels, with a slight bluish tinge on the bony portion. The inferior surface of the extremities is also white, but with a tinge of blue. The membrane of the feet or web is bordered with yellow.

DIMENSIONS. Length of head, $1\frac{1}{2}$ inches; length of shell, 9 inches; breadth, 8 inches; elevation, 3 inches.

HABITS. The habits of this species are similar to those of the *Trionyx ferox*.

GEOGRAPHICAL DISTRIBUTION. This animal has only yet been found in the Mississippi or its tributary streams.

GENERAL REMARKS. The *Trionyx muticus*, which was first noticed by Lesueur, though closely allied with the *Trionyx ferox*, is perfectly distinct, and is easily recognised by the total absence of spines or tubercles on the cartilaginous portion of the shell. Leconte, however, says he "cannot as yet consider it perfectly distinct," and this observation of his doubtless led several European naturalists to adopt the same opinion. Though the distinctive marks applied to this species by

Lesueur are some of them common to the *Trionyx ferox*, and others are not always present, still he gives two characters which always exist.

1. The total absence of spines or tubercles; and this is by no means the result of age, for they are never seen in large or small, young or old; whereas the spines always exist in the *Trionyx ferox*, even on those not over three inches in extent, as I have had abundant occasion to observe.

2. The great difference of the nostrils, as above described, which is equally constant. And to these others might be added; as, the difference in size; difference of geographical distribution, having never been found to the east of the Alleghany range of mountains, &c.

I have never yet had an opportunity of examining thoroughly this animal, as might be desired, to study its internal structure; yet Troost writes me, that its bony system differs in many remarkable points from that of the *Trionyx ferox*.

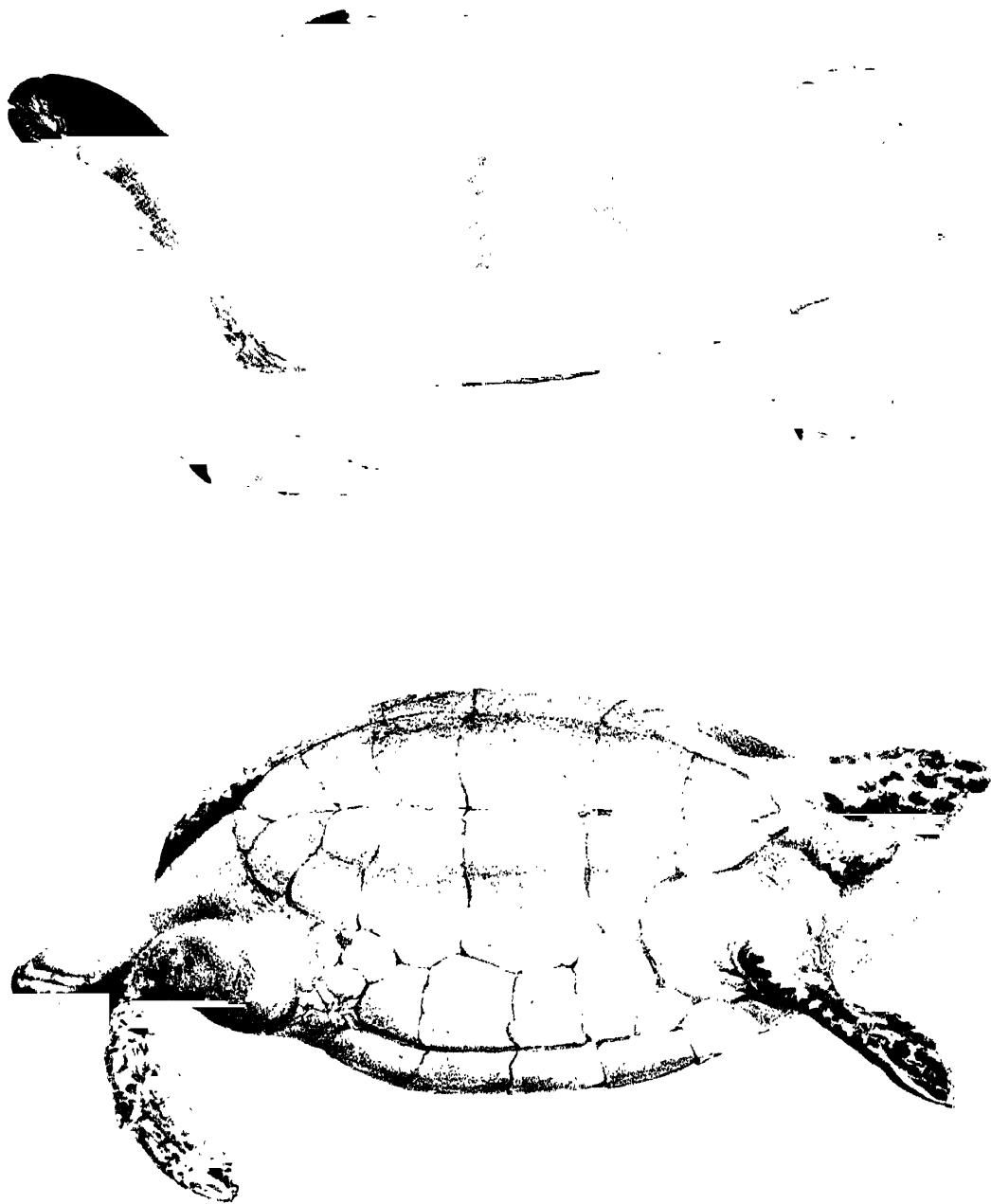
These are the only species of *Trionyx* that I am as yet prepared to admit into the catalogue of reptiles inhabiting the United States. The *Trionyx ocellatus* of Lesueur I consider only as the young of the *Trionyx ferox*, having had frequent opportunities of observing them.

FAMILY IV. THALLASSITES.* *Duméril et Bibron.*

CHARACTERS.

1. The shell is depressed and sub-cordiform.
2. The head is large and sub-quadrilateral, in some (*Chelonia*) covered with plates; in others (*Sphargis*) with a coriaceous skin.
3. The neck is short, thick, and not retractile.
1. The extremities are of unequal extent, the anterior having twice the length of the posterior. Both are greatly elongated, and so depressed or flattened, that the bones of the hands and feet, although formed of separate pieces, are incapable of distinct motion upon each other, but make a strong fin, useful only in swimming. Two genera are included in this family, *Chelonia* and *Sphargis*.

* Θαλάσσιος, θαλαττίς, in mari frequens.



Chelonia mydas

CHELONIA.—*Brogniart.*

GENUS CHELONIA.—CHARACTERS. Shell large, sub-cordiform; sternum entire; anterior extremities twice the length of posterior; bones of carpus and fingers, as well as of tarsus and toes, flattened and united, in form of a fin or paddle.

CHELONIA MYDAS.—*Linnæus.**Plate III.*

CHARACTERS. Head sub-oval; snout short and rounded; upper jaw slightly emarginate in front; lower jaw covered with three corneous portions, cutting margin deeply serrated, and furnished with a hook in front; shell sub-cordiform, smooth, covered with thirteen vertebral and lateral plates, not imbricated; a single nail to each extremity.

SYNONYMES. La Tortue franche, *Dutertre*, Hist. des Antil., tom. ii. p. 227.

Green Turtle, *Catesby*, Carolina, &c., vol. ii. p. 38, pl. xxxviii.

Green Turtle, *Brown*, Hist. Jam., p. 465.

La Tortue franche, *Lacépède*, Quad. Ovip., tom. i. p. 54, fig. 1.

La Tortue à écailles vertes, *Lacépède*, Loc. Cit., p. 92.

Testudo mydas, *Linnæus*, Syst. Nat., tom. ii. p. 350.

Testudo mydas, *Gmelin*, Syst. Nat. Lin., tom. i. part iii. p. 1037.

Testudo mydas, *Schoepff*, Hist. Test., p. 73, tab. xvii. p. 2.

Testudo mydas, *Latreille*, Hist. Nat. Rept., tom. i. p. 22, tab. i. fig. 1.

Testudo mydas, *Daudin*, Hist. Nat. des Rept., tom. ii. p. 10, pl. xvi.

Testudo mydas, *Shaw*, Gen. Zool., vol. iii. part i. p. 80, pl. xxii.

Chelonia mydas, *Schweigger*, Prod. Arch. Königsb., tom. i. p. 412.

Caretta esculenta, *Merrem*, Versuch eines Syst. der Amphib., p. 18.

Caretta mydas, *Fitzinger*, Neue Class. der Rept., p. 44.

Chelonia mydas, *Gray*, Synops. Rept., p. 52.

Chelonia mydas, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. ii. p. 538.

Green Turtle, *Vulgo*.

DESCRIPTION. The shell is sub-cordiform, broader in front, narrower and slightly notched and serrated behind. Above the neck the anterior margin of the shell is curved inwards, and over the anterior extremities on each side is a similar curvature, but less distinct, and the whole is covered with thirteen vertebral and lateral plates. The anterior vertebral plate is irregularly hexagonal, broad before, narrow behind, with a notch in its posterior margin; the second is narrow, hexagonal, with projecting lateral angles, its posterior border slightly concave, and its anterior with a pointed angle that is received into the first vertebral plate; the third and fourth are also hexagonal, with similar lateral angles, and with their anterior borders but slightly rounded; the fifth is irregularly heptagonal, broader below, narrow and prolonged above. The first lateral plate is irregularly quadrilateral, rounded in front and below; the second and third are quadrilateral, and so is the fourth, regularly, but smaller. There are twenty-five marginal plates; the nuchal, or intermediate, is irregularly quadrilateral, its posterior margin twice the extent of the anterior, which is arched inwards; the first marginal is small and triangular, with its basis before and apex behind, truncate, and joined by a short border to the anterior vertebral; the second marginal is elongated-pentagonal, and passes in above the first to the anterior vertebral; the remaining marginal plates are very regularly quadrilateral to the eleventh, which is pentagonal, and the twelfth, or supra-caudal, is of trapezoid form.

The sternum is long, oval, broad, entire, full and rounded before, full and entire but smaller behind. The inter-gular plate is a small, equilateral triangle, with its basis before; the gular are isosceles triangles, with their bases forwards and outwards; the brachial are elongated-quadrilateral, narrowest within; the thoracic are large, broad, and hexagonal, with their three shortest borders external; the

abdominal are nearly of the same form, but larger; the femoral are heptagonal, while the sub-caudal are regularly triangular, with their bases outwards and backwards, with an exceedingly minute, triangular, inter-subcaudal plate, from which reaches a row of larger scales or plates towards the vent. There are four large supplemental plates, with several smaller ones; of the larger plates the anterior is quadrilateral, and joined to the thoracic; the second is pentagonal, and joins within to the thoracic and abdominal; the third is regularly quadrilateral, and connected also internally with the abdominal; the fourth is rounded, hexagonal, with its internal margin united to the abdominal and femoral; besides this, it has a smaller triangular plate joined to its outer and posterior border; there are still some supernumerary plates, variable in number, extending between the sternum and carapace, placed in a row along the outer margin of the gular, brachial, and thoracic plates; one of these is largest of all, and is extended between the brachial and thoracic.

The head is moderately large, oval, slightly compressed at the sides; the snout rounded, with the nostrils anterior but directed a little upwards. Above and at the sides the head is covered with numerous plates of various sizes; of these the vertical is rounded, pentagonal; the superior orbital are oblong; the frontal are hexagonal, broad and rounded; the anterior frontal are also hexagonal, but are narrower and elongated, broader behind, with their longest margin within. The occipital plates are three in number; the anterior broad and heptagonal, the two posterior are equally broad but trapezoid. The walls of the orbit of the eye are completed in front and below by the corneous part of the upper jaw, and behind, by three or four small polygonal posterior orbital plates, back of which are seen ten or twelve small polygonal temporal plates, arranged in three perpendicular rows. The eyes are prominent; the eye-lids are well developed, and open obliquely from above downwards and forwards; the upper lid is large, heavy, and covered with eight or ten small plates, disposed in rows; the pupil is dark sea-blue; the iris golden, and in general reticulated and spotted with dusky, but it varies a good deal in different individuals. The upper jaw is slightly emarginate in front

and serrated at the sides; the lower is covered with three corneous portions, is deeply serrated at the cutting margin and furnished with a hook in front.

The anterior extremities are long, rounded at the shoulder, and covered with a tough skin and a few small plates; while the fore-arm, carpus and fingers are flattened like a fin, and are covered with large strong polygonal plates on the anterior border, and with smaller plates above and below; along the posterior margin of the fore-arm and carpus is extended a fold of skin, capable of being distended when the limb is stretched, or folded when it is flexed; in this are imbedded five or six large plates, quadrilateral or polygonal. There is one nail or horny point at the first joint of the anterior finger, of variable size, and sometimes slightly curved. The posterior extremity is short, rounded above, but flattened at the tarsus like a paddle, and covered like the anterior, but with smaller plates, and a fold of skin still more extensive on the posterior margin. The tail is short, thick, clumsy; covered with small, soft, flexible plates above, and has the vent near its tip.

COLOUR. The plates on the superior surface of the head are light brown in the centre, with the spaces between them yellow; those on the sides of the head are of similar colour, but are margined with yellow, which gives a yellow tinge to the temporal region; the neck above is dusky, and yellow near the shell, below it is yellow; the shell is light brown above, sometimes it approaches a dark fawn colour, marked with radiating or waving lines, or large blotches of dark brown—sometimes it is tinged with green. The sternum is delicate pale yellowish-white. The extremities and tail above are coloured like the shell, rather more dusky; below they are yellowish-white, tinged with green, and dusky near their tips.

DIMENSIONS. The dimensions in the individual here described, were as follows: length of head, $4\frac{1}{2}$ inches; breadth of head, $2\frac{1}{2}$ inches; length of shell, 19 inches; breadth, 14 inches; length of sternum, $12\frac{3}{4}$ inches; yet it frequently reaches a much greater size.

HABITS. The *Chelonia mydas* lives mostly in deep water, feeding on marine plants, especially one called turtle-grass, (*Zostera marina*;) this, according to Audubon, they cut near the roots, to procure the most tender and succulent part, which alone is eaten, while the rest of the plant floats to the surface, and is there collected in large fields, a sure indication that the feeding-ground of the Green Turtle is near. In confinement, however, they eat readily enough purslain, (*Portulacca oleracea*;) and even grow fat on this nourishment.

Green Turtles are very seldom seen to approach the land, unless at certain seasons to lay their eggs; in the months of April and May, great numbers seek for this purpose the sandy shores of desolate islands, or the uninhabited banks of certain rivers, where they are least liable to interruption in their work of reproduction. The Tortugas islands are a favourite haunt: these are four or five uninhabited sand banks, which are only visited by turtlers and wreckers. Between these islands are deep channels, so that the Turtles come at once to good landing. They are not confined however to these islands, but are found abundantly on other keys and inlets on the main. The female arrives by night, slowly and cautiously she approaches the shore, and if undisturbed, crawls at once over the sand above high water mark; here with her fins she digs a hole one or two feet deep, in which she lays her eggs, between one and two hundred in number. These she "arranges in the most careful manner, and then scoops the loose sand back over the eggs, and so levels and smooths the surface, that few persons on seeing the spot could imagine any thing had been done to it."* This accomplished, she retreats speedily to the water, leaving the eggs to be hatched by the heat of the sun, which is generally accomplished in about three weeks. Two or three times in the season does the female return to nearly the same spot and deposit nearly the same number of eggs, so that the whole amount annually would be four or five hundred; and it is not a little singular, that animals so low in the scale of creation, should have the instinct to return to these haunts from great distances, hundreds and even thousands of miles, in some instances in three

* Audubon's Ornithological Biography, vol. vi. p. 373.

weeks. Dr. Strobel informed me that several Turtles were captured at Tortugas, marked, and carried to Key West, there confined in a turtle-pen or "crawl," which was destroyed by a storm; the animals escaped, and in a few days were recaptured at the Tortugas. During the actual time of incubation Turtles may be approached without caution, for they are then so intent on this work of reproduction, that nothing will disturb them.

It is during the breeding season that these animals suffer most from their enemies; they are then taken in a variety of ways and are brought to our markets in immense numbers, being held in high estimation as a wholesome and delicious food. Many are caught at night on shore; these are turned on their backs, nor can they resume their natural position, in consequence of the shortness of their necks, and peculiar arrangement of their fins, and thus they remain until they can be leisurely collected the next day. Some are harpooned in the water; and great nets are spread for others at the entrance of creeks and rivers. Many are also taken by an instrument called a *peg*, which has been in common use since the time of Catesby, who thus describes the process. "The way in which Turtles are most commonly taken, is by striking them with a small iron peg of two inches long, put in a socket at the end of a staff twelve feet long; two men usually set out for this work in a light boat or canoe, one to row and gently steer the boat, while the other stands at the head of it with his *striker*. The Turtles are sometimes discovered by these men with their head and back out of the water, but they are more often found lying at the bottom, a fathom or more deep. If a Turtle perceives he is discovered, he starts up to make his escape, the men in the boat pursuing him, endeavour to keep sight of him, which they often lose, and recover again by the Turtle putting his nose out of the water to breathe. It is sometimes half an hour before he is tired, when he sinks at once to the bottom, and this gives them an opportunity of *striking* him, which is done by piercing him with an iron peg, which slips out of the socket, but is fastened by a string to the pole. If spent and tired, he tamely submits when struck to be taken into the boat and hauled ashore."

Audubon observes that he saw a man who, with his *peg*, had been known to secure eight hundred Green Turtles in one year—an immense number certainly. When taken, they are kept in pens, called “crawls,” that are so placed in the water as to be filled at every flood tide; and here they remain until sold. A still more wholesale mode of destruction is practised by robbing the nests of their eggs. The “egger” uses a small stiff rod, with which he “probes” the sand in those places where Turtles usually deposit their eggs; and in this way myriads are collected, as may be supposed, when it is recollected that many hundreds of Turtles lay their eggs on a small space of sand bank. The “eggers,” however, do not confine their depredations to the nests of the Green Turtles, but they seize upon those of all other species, as well as upon the eggs of thousands of sea birds that seek the same localities during their breeding season.*

But man is not their only enemy; many eggs are destroyed by Racoons, and many young ones fall a prey to various rapacious aquatic birds, before they reach the water; and many more, even after they have reached it, are devoured by ravenous fishes.

GEOGRAPHICAL DISTRIBUTION. The *Chelonia mydas* inhabits the sea coast of the extreme southern points of the United States; it has been seldom found as far as latitude 34, which must be considered its northern limit.

GENERAL REMARKS. It is a little doubtful if Linnæus had our animal in view when he gave the specific characters of his *Testudo mydas*, but it is so considered by many naturalists, and almost all have adopted the name.

As yet I am not prepared to receive into the catalogue of North American reptiles the *Chelonia virgata* of Cuvier, described by Dumeril and Bibron, as well as by Cocteau in Ramon de Lasagra’s “*Histoire de l’Isle de Cuba*,” as inhabiting our shores. That such an animal may exist in the Red Sea, as

* Audubon, loc. cit., p. 373.

observed by Bruce, is probable enough, but with us all the Green Turtles that have ever fallen under my observation appertained to one species, the *Chelonia mydas*; this animal however varies much in shape at different epochs of life: the carapace is broader in the young, and the vertebral plates are then more extensive transversely, as in the *Chelonia virgata*. They vary also exceedingly in colour, so that of hundreds that I have frequently seen together scarcely two could be selected of precisely similar colours; some were marked as above stated; others were darker; some with the shell radiated with dark or with light brown; others had an olive hue; while in the old animals a remarkable tinge of green prevailed over the whole superior surface of the body; and some young specimens I have seen marked with colours similar to the *Chelonia imbricata*, and nearly as beautiful; so that colour alone, as in the *Cistuda Carolina*, is here insufficient to distinguish species.



Chelonia caretta.

CHELONIA CARETTA.—*Linnæus*.*Plate IV.*

CHARACTERS. Head of great size; upper jaw nearly straight; lower jaw more or less hooked; shell elongated, sub-cordiform, smooth, with a crescentic notch in the posterior border; vertebral plates five; lateral plates ten, not imbricated; marginal twenty-five; two spines to each extremity.

SYNONYMES. Loggerhead Turtle, *Catesby*, Carolina, &c., vol. ii. p. 40, pl. xl.

Testudo caretta, *Linnæus*, Syst. Nat., tom. i. p. 351.

Testudo caretta, *Gmelin*, Syst. Nat. Lin., tom. i. part iii. p. 1038.

La Caouana, *Lacépède*, Quad. Ovip., tom. i. p. 96.

Testudo caretta, *Schoepff*, Hist. Test., p. 67, tab. xvi.

Testudo caretta, *Latreille*, Hist. Nat. Rept., tom. i. p. 53.

Testudo caouana, *Daudin*, Hist. Nat. des Rept., tom. ii. p. 54, tab. xvi. fig. 2.

Testudo caretta, *Shaw*, Gen. Zool., vol. iii. part i. p. 85, pl. xxiii., xxiv., xxv.

Chelonia caouana, *Schweigger*, Prod. Arch. Königsb., vol. i. p. 292, 418.

Caretta cephalo, *Merrem*, Versuch eines Syst. der Amphib., p. 18.

Chelonia caouana, *Wagler*, Natürlioh. Syst. der Amphib., p. 133.

Chelonia caouana, *Gray*, Synops. Rept., p. 53.

Chelonia caouana, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. ii. p. 552.

Loggerhead Turtle, *Vulgo*.

DESCRIPTION. The shell is sub-cordiform, slightly concave in front and over the shoulder, and with a deep crescentic notch behind. The anterior vertebral plate is hexagonal, with its largest border in front, and slightly arched forwards, and is most extensive in the transverse direction. The second and third plates are hexagonal, elongated, much the most extensive in the longitudinal direction, with

short lateral angles, connected with the adjoining lateral plates; the fourth vertebral is also hexagonal, but shorter, and with lateral angles more extended; the fifth vertebral plate is pentagonal, slightly concave in front, with extensive lateral margins and four articulating facets below. In the old animal all these plates are nearly on an horizontal plane; the first being but very little curved downwards in front, and the fifth as little behind. The lateral plates are five in number, the first is smallest, with regularly triangular margins, and its basis directed forwards and downwards; the second is irregularly quadrilateral, rounded below and in front; the third and fourth are pentagonal, with two short borders above, meeting at an obtuse angle; the fifth lateral plate is irregularly quadrilateral, broader below, or it has its posterior and inferior angle truncated where it joins the eleventh marginal, which gives it a pentagonal form.

Of the twenty-five marginal plates, the intermediate, or nuchal, is short in the longitudinal, and more than three times as large in the transverse direction; it is small in the middle, slightly concave behind, and much more so in front, and large at its lateral extremities, each having two articulating surfaces, an upper smaller, to join with the first lateral, and a lower larger, to unite with the first marginal plate. The anterior marginal is irregularly quadrilateral and arched outwards; the second is also quadrilateral, but concave in front; this and part of the fourth making a border arched inwards over the anterior extremities; the third is irregularly quadrilateral, smaller above, larger below; the remaining marginal plates to the eleventh included, are quadrilateral, and make an entire border, sometimes waving, between the tenth and eleventh; the twelfth or supra-caudal plates are sub-rhomboidal, and have a deep crescentic notch between them at their posterior margin.

The sternum is very full and rounded in front, smaller, but rounded behind. The gular plates are large equilateral triangles, with their outer border rounded; the brachial are regularly pentagonal, and so are the thoracic plates, but elongated; the abdominal are broad and pentagonal; the femoral are also pentagonal, but very irregularly so, having their posterior and external border concave; the

sub-caudal are triangular, with their outer borders rounded. There are four principal supplemental plates, the anterior of which is small, and does not reach the sternum; the three others are very large; the second is pentagonal, and joins the thoracic; the third is quadrilateral, and unites with the abdominal; the fourth is trapezoid, and is connected both with the abdominal and femoral plates; besides these, there are some smaller plates that border the brachial and thoracic; the two larger of which connect the second supplemental with the anterior border of the thoracic plate, but none reach the shell.

The head is extremely large, broad behind, rather rounded in front, and covered above with about twenty polygonal plates of various sizes. The vertical is small and hexagonal; on each side it has the superior orbital, which are elongated, pentagonal and broadest within; behind these are the posterior superior orbital, one on each side, of similar form but larger without; behind these again, and on the same longitudinal line, are the parietal plates, of irregular pentagonal form; in the midst of all these plates, and united to all, is a large broad occipital, having two or three small plates on its posterior border. There are three posterior orbital plates; the superior of which is pentagonal and large, the middle is hexagonal and nearly of the same size; the inferior is largest of all, oblong, and makes part of the inferior wall of the orbit; behind these are four longitudinal rows of temporal plates, varying in size and number; the frontal are large and pentagonal, the nasal are small and hexagonal, with a narrow elongated trapezoid inter-nasal plate, which is continued back between the anterior part of the frontal. The upper jaw is protected by a thick horny covering, rounded in front and broad, narrow behind and reaching under the orbit of the eye.

The nostrils are anterior, near together, and placed in a cartilaginous substance that occupies the space between the nasal plates and the horny covering of the upper jaw. The eyes are large and prominent; the lids are covered with small plates, and open obliquely from behind downward and forward; the pupil is deep sea-blue, with a dusky grey iris. The upper jaw is strong, nearly a straight line, being but slightly bent downwards in front; the lower jaw is equally firm and

strong, and is more or less hooked or turned upwards in front. The neck is short, very thick and strong, and covered with a granulated skin and minute flexible plates both above and below.

The anterior extremities are long and powerful, rounded at the shoulder, covered with a tough skin and with a few scattered minute flexible plates, depressed and flattened like a fin at the fore-arm, carpus and fingers, and covered with large square pentagonal plates. A remarkable range of these exists along the anterior border; while the posterior margin is bordered with a loose fold of skin capable of distention, in which are placed here and there large plates; in front there are two spines or nails, corresponding with the two first fingers, and of these the first is largest and often hooked. These nails vary in extent; sometimes they are more than an inch long. The posterior extremities are much shorter, rounded above, covered in like manner, and only become flattened like a paddle toward the tarsus and toes, where alone are found large plates. The posterior extremity is also armed with two spines; but these are smaller, shorter and near together. The tail is short, thick, and conical.

COLOUR. The plates of the head are yellowish-chestnut or olive-brown in their centre, but have their margins so yellow as to give a strong tinge to the whole; the jaws are yellowish horn-colour. The plates of the shell are light brown, varying in degree, and have sometimes a tinge of olive, and are often bordered with a dirty yellowish tinge; the marginal have it more distinctly, which gives to the whole shell a strong shade of yellow; the young are at times coloured not unlike the Green Turtle; in very old animals the whole shell becomes dusky olive, as seen in the accompanying figure, and the shell is covered with various parasitic animals, as *Serpulæ*, *Balani*, and other multivalve shells, &c.; the upper surface of the extremities, and tail is dusky along their centre, but yellow on the borders; the inferior surface of the whole animal is yellow, more or less clouded.

DIMENSIONS. Length of head, 12½ inches; breadth of head, 10 inches; length of shell, 3 feet 6 inches; breadth of shell, 34 inches; length of sternum, 28 inches.

This is the largest species of Tortoise with a hard shell; sometimes weighing, it is said, sixteen hundred pounds. The young animal varies considerably from the adult in shape and colour; the shell is shorter and broader in proportion; the vertebral plates have each a tubercle, which forms a distinct carina; the lateral have similar tubercles, but smaller, and these finally disappear as the Tortoise advances in years; the posterior and external angles of most of the marginal plates project so much as to give a serrated appearance to more than half of the posterior part of the shell. The jaws, though equally strong in proportion to the size of the animal, are both but slightly hooked in front, the inferior most so. The colour of the young differs in having the chestnut-brown more distinct and often radiated with yellowish or lighter brown.

HABITS. This animal is much bolder than the *Chelonia mydas*, and lives altogether on animal food; it is extremely voracious, and devours great quantities of shell-fish, as the various *Buccinii* and *Trochi*, especially a large conch (*Strombus*) which it breaks easily between its stout mandibles. It is a strong swimmer, and is frequently seen in the midst of the ocean, floating on the surface of the waves, motionless, and apparently asleep; in which situation they are often captured.

GEOGRAPHICAL DISTRIBUTION. This animal has a much wider range than the Green Turtle, and is found on the shores of nearly all the Atlantic states, and frequently lays its eggs on the southern aspect of sandy shoals, along the coast of Georgia, Carolina and Virginia. Though much more wary and shy in its habits than the *Chelonia mydas*, yet it takes far less pains in seeking out retired and desolate spots to deposit its eggs.

GENERAL REMARKS. The Loggerhead has the same enemies to contend with as the Green Turtle; though he is sought after with little ardour, as his flesh is so rank and tough that it is nearly unfit for nourishment, especially in old animals, and their shells cannot be used in the arts; yet the war against their eggs is equally exterminating, as they are as good food as those of any other species.

Sometimes the young are brought to our markets, and are considered tolerable food; or the old animal is cut up and sold in pieces by the pound, as is sometimes the better kind of Turtle, but only to people unacquainted with the appearance of the flesh, and then the venders conceal the head, to escape detection.

To Dr. B. B. Strobel I am indebted for a singular variety of this animal, if it should not prove a distinct species. The form of the body is nearly the same, but the margin of the shell is entire posteriorly; the neck is short, with a large flexible wart on either side. The animal came from Key West, and was unfortunately destroyed before a full description could be made out.



Chelonia imbricata

CHELONIA IMBRICATA.—*Linnæus*.*Plate V.*

CHARACTERS. Head elongated, narrow; snout prolonged; jaws without serræ, both hooked; shell oval; slightly carinate, sub-cordiform, concave in front, flattened and serrated behind, and covered with thirteen vertebral and lateral plates, remarkably imbricated; two nails to each extremity.

SYNONYMES. La Tortue caret, *Dutertre*, Hist. des Ant., tom. ii. p. 229.

Hawksbill Turtle, *Catesby*, Carolina, &c., vol. ii. p. 39, tab. xxxix.

Hawksbill Turtle, *Brown*, Hist. Jam., p. 463.

Testudo imbricata, *Linnæus*, Syst. Nat., tom. i. p. 350.

Le caret, *Lacépède*, Hist. des Quad. Ovip., tom. i. p. 105, tab. ii.

Testudo imbricata, *Gmelin*, Syst. Nat. Lin., tom. i. p. 1036.

Testudo imbricata, *Schoepff*, Hist. Test., p. 85, tab. xviii.

Testudo imbricata, *Latreille*, Hist. Nat. Rept., tom. i. p. 50.

Testudo carretta, *Daudin*, Hist. Nat. des Rept., tom. ii. p. 39.

Testudo imbricata, *Shaw*, Gen. Zool., vol. iii. part i. p. 89, pl. xxvi. xxvii.

Caretta imbricata, *Merrem*, Versuch eines Syst. der Amphib., p. 19.

Chelonia imbricata, *Schweigger*, Prod. Arch. Königsb., vol. i. p. 291 and 408.

Chelonia imbricata, *Gray*, Synop. Rept., p. 52.

Chelonia imbricata, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. ii. p. 547.

Chelonia imbricata, *Cocteau*, Hist. de l'Isle de Cuba, par Ramon de Lasagra, p. 28.

Hawkbill Turtle, *Vulgo*.

DESCRIPTION. The shell is depressed, oval or sub-cordiform, almost ecarinate, slightly concave in front and over the shoulders, flattened, narrow and serrated behind, and covered with thirteen plates, imbricated like tiles on the roof of a house. Of these plates the first vertebral is irregularly hexagonal, larger in front

and slightly prominent in the centre; the second and third are also hexagonal, with their anterior margins concave and slightly rounded behind, to fit the adjoining plates; the fourth is similar in form, but broad before and narrow behind; the fifth is irregularly trapezoid; the first lateral plate is irregularly quadrilateral, longest in the transverse direction, and rounded at its anterior and external margin; the second and third are pentagonal; the fourth is quadrilateral and smaller, with its posterior border shortest; of the marginal plates, the nuchal, or intermediate, is irregularly quadrilateral, extensive transversely, narrow at the middle, and concave in front; the first marginal is irregularly triangular, with its external angle curved; the second is quadrilateral, as well as the third, fourth, fifth, sixth and seventh, and more or less elongated; the eighth, ninth, tenth and eleventh have their outer and posterior angles more and more developed, and projecting beyond the adjoining plates; the twelfth are trapezoidal, with a deep notch between them, which gives a serrated appearance to the posterior margin of the shell more or less distinct: these plates are all imbricated, and smooth, but in old age they sometimes become wrinkled.

The sternum is large, full, entire in front and behind, but hollow and depressed along the mesial region; the inter-gular plate is small, triangular, with a rounded base directed forwards; the gular are irregularly quadrilateral, elongated outwards and forwards; the brachial are irregularly quadrilateral, large, and most so in the transverse direction, with their anterior and external angles truncated; the thoracic and abdominal are quadrilateral and very extensive, most so transversely; the femoral are also broad, but are irregularly quadrilateral, having their posterior and external angles truncated; the sub-caudal are irregularly trigonal and elongated; of the supplemental plates, the axillary is irregularly pentagonal, the inguinal is quadrilateral, and between these are two quadrilateral or pentagonal plates that unite the abdominal and femoral with the marginal.

The head is oval, elongated, compressed at the sides, and very narrow in front of the eyes. The upper jaw is greatly prolonged, and hooked anteriorly, like the beak of a hawk, from which circumstance the common name of the animal is

derived. The lower jaw is also elongated, and furnished in front with a smaller or less developed hook or tooth ; and both have their cutting margins entire or without serræ.

The vertical plate is hexagonal, very large, and is joined before to the frontal, behind to the occipital, and laterally to the superior orbital, which are oblong and of hexagonal form; the frontal plate is large, hexagonal, with its greatest extent in the antero-posterior direction, and joined before to the anterior frontal plates, and behind to the superior orbital; there are two anterior frontal plates of similar form, but very small, and largest transversely; the nasal are minute and pentagonal; there are four occipital, the internal are larger and quadrilateral; the external are smaller and of triangular shape; there are two parietal that unite with the superior orbital plates; and three very small posterior orbital plates, the upper quadrilateral and larger; behind these there are several polygonal temporal plates.

The nostrils are small, anterior, and closely approximated. The eyelids are large, the upper by far the greater, and covered with some large flexible scales; they open obliquely from above, downwards and forwards. The eyes are large and prominent; the pupil deep sea-blue; the iris golden, reticulated with light brown.

The anterior extremities are very long, though not broad, and are not unlike the wings of an eagle in shape; at the shoulder they are covered with small flexible plates; at the fore-arm, carpus and fingers the plates are much larger and of variable form; a row of large plates, slightly imbricated, ten or twelve in number, are placed on the anterior border; those along the fore-arm are hexagonal; those at the fingers are rather quadrilateral; on the posterior margin is a fold of skin, in which are placed several large, elongated, quadrilateral plates; in front there are two elongated nails. The posterior extremities are half the length of the anterior, rather rounded at the thigh, but flattened like a paddle at the tarsus and toes, and are covered like the anterior, but with smaller plates,

and are also furnished with two elongated nails. The tail is short, conical and covered with soft flexible plates, disposed without order.

COLOUR. The plates of the head are chestnut-brown in the centre, sometimes tinged with red, with their margins of a lighter colour; the jaws are yellowish, with occasional bars of brown; the neck above is dusky; the chin and throat yellow; the plates of the shell are fawn colour, more or less bright, and marked with radiating or waving bars or spots or blotches, of variable size, and beautiful bright chestnut-brown; the sternum is yellow; the extremities and tail are coloured above like the shell, but more dusky, and are dingy-yellow below.

DIMENSIONS. The dimensions of the animal here described, were as follows: length of head, 5 inches; length of shell, 18 inches; length of sternum, $11\frac{1}{2}$ inches. Sometimes, however, they approach the Green Turtle in size.

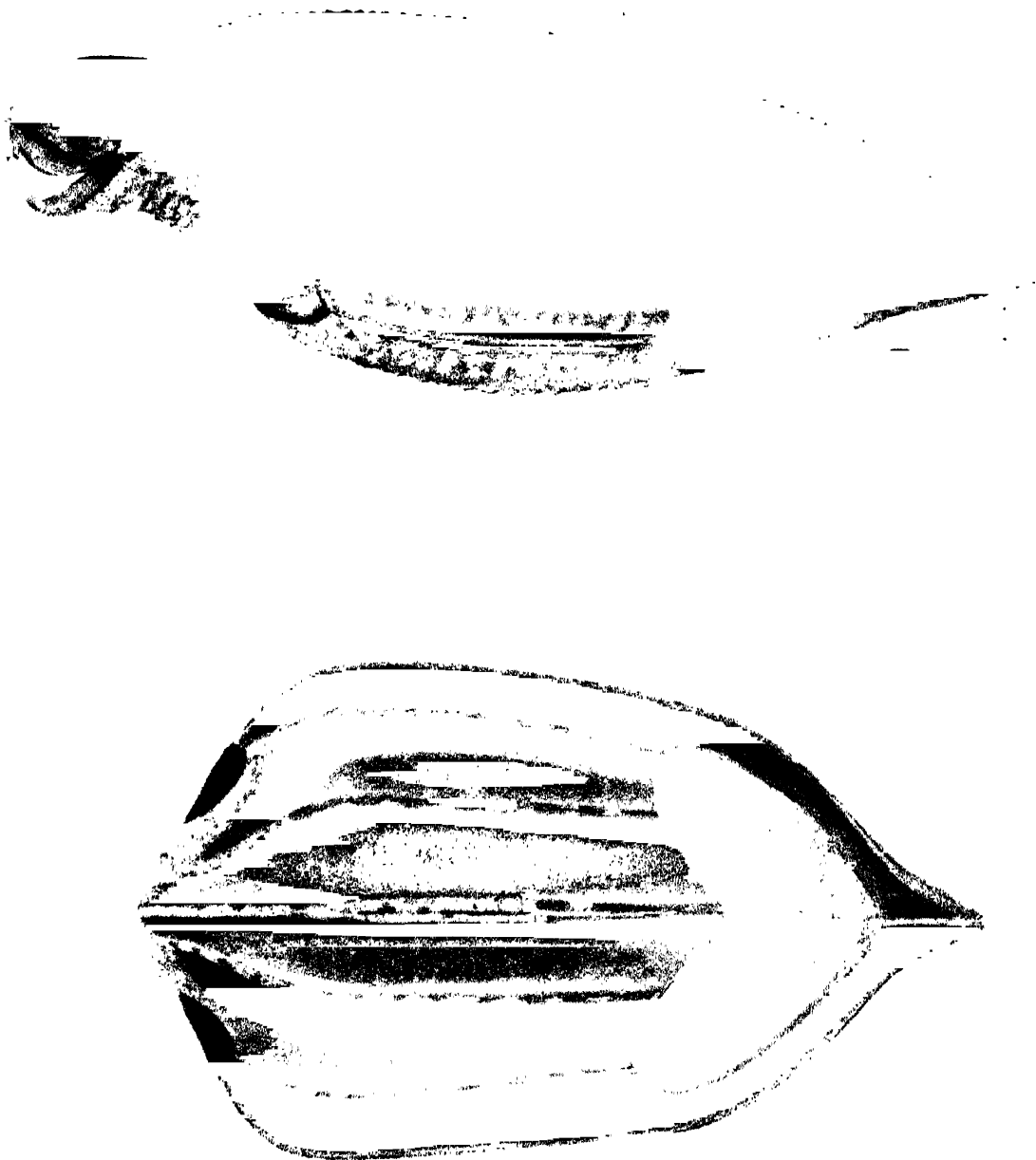
HABITS. In their native condition I am not aware that the habits of this animal differ from those of the *Chelonia caretta*; they seek similar localities and the same food, but in confinement they seem much more ferocious: I have observed them bite severely the *Chelonia mydas*, when swimming together in the same reservoir, though the other gave no offence; nor did he offer retaliation for the injury received.

GEOGRAPHICAL DISTRIBUTION. The *Chelonia imbricata* is found only at the extreme southern points of the United States; once only I knew a fine specimen driven to the shores of Carolina during an equinoctial storm.

GENERAL REMARKS. This animal is only esteemed for the substance it affords, called "Tortoise-shell," which is but the lamina or plates that cover the bony shell. Other species of *Chelonia* have a similar covering, but in no other are these plates sufficiently thick to be of any value in the arts. These lamina are obtained by exposing the convex portion of the shell to a certain degree of heat, which destroys the connection between the plate and the shell; it is now recurved

from the borders towards the centre, and can then be easily removed. These plates vary in thickness and in transparency, and are consequently arranged in classes of different value. Tortoise-shell is not considered of the best quality unless the animal has reached a certain size, about one hundred and sixty pounds; before that state, it is too thin. The quantity obtained varies much in weight in different animals; fifteen pounds is the most obtained even from animals of the largest size; yet this substance is so valuable that a *Chelonia imbricata* of the same dimensions with a Green Turtle would sell for ten times as much.

The lamina, when separated, are delicate and easily broken; yet, by certain management, they can be made to take on any desired form; this is done by immersing them for a time in hot water, and then placing them in moulds of iron or wood; many portions may be joined together by cutting or scraping the edges thin, and placing them in accurate contact, in which position they must be retained, and kept in boiling water till softened, then removed and suddenly cooled; and thus can a continuous surface of great extent be produced, even sufficient to cover pillars and doors, as practised by the ancients, with whom it was held in great estimation. For information as to the procedure of arranging this substance for different purposes, as well as for the various uses to which it is applied, we may refer to those works of art that treat on the subject.



Spargis coriacea.

S P H A R G I S.—*Merrem.*

GENUS SPHARGIS.—CHARACTERS. Body covered with a coriaceous skin, tuberculated in the young, smooth in adult animals; extremities pinniform, without nails.

SPHARGIS CORIACEA.—*Linnaeus.**Plate VI.*

CHARACTERS. Head large; jaws strong, superior having three deep triangular notches, inferior hooked; body covered with a coriaceous skin, tuberculated in the young, smooth in adult animals; extremities without nails.

SYNONYMES. Testudo coriacea, *Linnaeus*, Syst. Nat., tom. i. p. 350.

Testudo coriacea, *Schneider*, Schildk., p. 312.

Testudo coriacea, *Gmelin*, Syst. Nat. Lin., tom. i. part iii. p. 1036.

La Tortue Luth, *Lacépède*, Quad. Ovip., tom. i. p. 111.

Testudo coriacea, *Latreille*, Hist. Rept., tom. i. p. 58.

Testudo coriacea, *Shaw*, Gen. Zool., vol. iii. p. 77.

Testudo coriacea, *Daudin*, Hist. Nat. des Rept., tom. ii. p. 62.

Sphargis mercurialis, *Merrem*, Versuch eines Syst. der Amphib., p. 19.

Dermochylis Atlantica, *Lesueur*, Reg. An., tom. ii. p. 14.

Dermatochylis porcata, *Wagler*, Natürlich. Syst. der Amphib., p. 133.

Sphargis coriacea, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. ii. p. 560.

Sphargis coriacea, *Storer*, Boston Jour. Nat. Hist., vol. iii. p. 16.

DESCRIPTION. The carapace is sub-cordiform, largest before and deeply concave over the neck; concave also over each of the anterior extremities, but less so. It is narrow and pointed behind and above, and is marked with seven longitudinal carinæ: one of these runs along the vertebral line, throughout its whole extent; on each side of this are three other ridges, the external on each side following the margin of the carapace from its anterior to its posterior extremity, where they meet above the tail in a point. The surface between these ridges is perfectly smooth.

The sternum is large, very full in front, and truncated squarely, smaller and obtuse-angled behind: it is perfectly flat, without any prominence or tubercle whatever.

The head is very large, sub-triangular, slightly compressed in front and above, without plates or scales, and covered only by the skin. The jaws are exceedingly strong, the superior with three deep triangular notches in front; the inferior is recurved anteriorly in an angular point, which is received into a central notch of the upper jaw when the mouth is closed. The nostrils are anterior, and near together.

The neck is short, very thick, and covered with a coriaceous skin, and at the throat are a few depressed tubercles.

The anterior extremities are large and well developed; they are twice the length of the posterior, which are broader in proportion; both are covered with a coriaceous skin—neither have any trace of nails. The tail is short, and extends but little beyond the carapace.

COLOUR. The whole superior surface of the animal is very dark brown, with the exception of the ridges on the back, which are tinged in different places with obscure dirty white. In the young *Sphargis coriacea* the colour is less dark, and

is studded with light-coloured spots; the jaws are horn colour; the throat and abdomen dirty yellow.

DIMENSIONS. This is doubtless the largest of all the *Chelonia*, reaching at times the enormous weight of twelve hundred pounds and more. The following are the measurements taken by an excellent herpetologist, my friend Dr. E. Hallowell, of Philadelphia, from a specimen caught in Chesapeake Bay in 1840:—Length of head, 12 inches; elevation at angle of jaw, $7\frac{1}{2}$ inches; breadth in front of orbits, 5 inches; greatest breadth of occiput, 12 inches; length of carapace, 4 feet 11 inches; greatest breadth, 3 feet 8 inches; elevation, $19\frac{1}{2}$ inches; length of anterior extremities, 3 feet $5\frac{1}{2}$ inches; of posterior extremities, 1 foot 11 inches; of tail, 13 inches: total length, 7 feet 8 inches.

GEOGRAPHICAL DISTRIBUTION. The *Sphargis coriacea* inhabits the Atlantic Ocean.

GENERAL REMARKS. There can be no doubt that this animal is the *Testudo coriacea* of Linnæus. It is so exceedingly rare, that I have never seen but the dried specimen, from which my description is taken. As to the colour, however, I think it may be relied on, as it was done from life by Mr. Richard.

ORDER II. SAURIA.—*Brogniart.*

CHARACTERS.

1. The body is elongated, rounded, and covered with plates, or scales, or granulations, and is destitute of a carapace or shell.
2. There is always a sternum, and distinct, movable ribs.
3. The tail is elongated, and the vent commonly transverse.
4. The extremities are usually four in number.
5. The eyelids are visible, and so is generally the membrane of the tympanum.
6. The mouth is large, and without movable lips.
7. The rami of the lower jaw are anchylosed at the chin, and are armed with teeth.
8. The heart is composed of two auricles and one ventricle, sometimes subdivided by imperfect partitions.
9. There are two lungs, of nearly equal development, and extending more or less into the abdominal cavity.

10. Their eggs have a cretaceous covering of greater or less firmness.

11. The young animals undergo no metamorphosis.

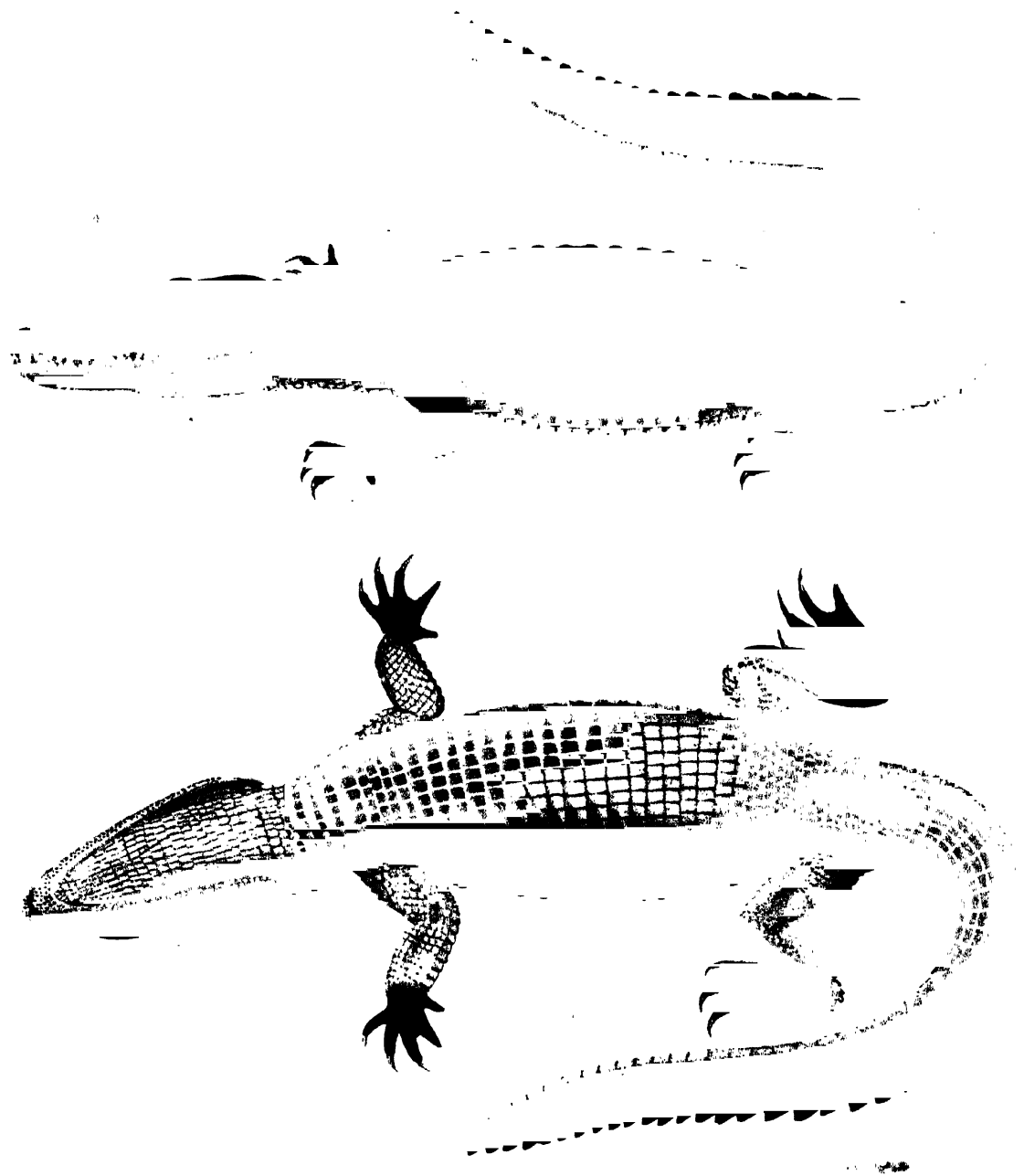
REMARKS. Brogniart first established the order Sauria, and gave it accurate and well defined limits; before his time, Linnæus arranged in the genus *Lacerta*, not only all Lizards, but Salamanders and Tritons also. This order at present includes nearly five hundred species, distributed in eight families. Of this great number only about fourteen different species have hitherto been found within the limits of the United States.

FAMILY. CROCODILIDA. *Cuvier.***CHARACTERS.**

1. The head is large, and covered with a thick, closely adherent skin.
2. The nostrils are approximated, and open near the snout; they are furnished with movable valves, and communicate with the fauces by a long narrow canal.
3. The eyes are protected by three lids.
4. The external opening of the ear is furnished with two movable lips, one above, the other below, by which it can be closed.
5. The mouth is very large, opening even behind the cranium.
6. The tongue is fleshy, flat, closely adherent at its borders, and not at all protractile.
7. The teeth are simple, conical, pointed, hollow at their bases, of unequal size, and placed in a single row.
8. The body is covered above with large, square plates, more or less carinated; those of the back are elevated in longitudinal ridges; the abdomen is protected by large, square, and smooth plates.

9. The tail is longer than the body, stout, compressed at the sides, covered with square plates, verticillated; those above are so carinated as to form a strong, deeply serrated crest, double at its base and single towards its tip.
10. There are four extremities—the anterior with five fingers, the posterior with four toes, either palmated or semi-palmated. Both anterior and posterior are armed each with three nails.

The family Crocodilida, thus characterized, embraces three genera, viz: Alligator, Crocodilus, and Gavialis; of these the first only is found in the United States.



Alligator Mississippiensis.

ALLIGATOR.—*Cuvier*.

GENUS ALLIGATOR.—CHARACTERS. The fourth tooth of the lower jaw on each side largest, and received in a socket of the upper; posterior extremities rounded, without crests or dentations; toes never more than semi-palmated.

ALLIGATOR MISSISSIPPIENSIS. *Daudin*.

Plate VI.

CHARACTERS. Nostrils separated from each other by a bony partition; forehead divided by a short, prominent, longitudinal carina; four large tubercles on the neck, arranged in rows on each side of the vertebral line.

SYNONYMES. Alligator, *Catesby*, Carolina, &c., vol. ii. p. 63, pl. lxiii.

Alligator, *Bartram*, Travels in Florida, &c., p. 126.

Crocodile de la Louisiane, *Lacoudrenière*, Journ. de Phys., tom. xx. p. 333.

Crocodylus Mississippiensis, *Daudin*, Hist. Nat. des Rept., tom. ii. p. 412.

Crocodylus lucius, *Cuvier*, Ann. Mus., tom. x. p. 28, pl. i. fig. 8, pl. ii. fig. 4.

Alligator lucius, *Merrem*, Versuch eines Syst. der Amphib., p. 34.

Crocodylus Cuvieri, *Leach*, Zool. Miscel., vol. i. p. 102.

Alligator lucius, *Fitzinger*, Neue Class. der Rept., p. 46.

Alligator Mississippiensis, *Gray*, Synops. Rept., p. 62.

Crocodylus lucius, *Harlan*, Med. and Phys. Res., p. 146.

Alligator lucius, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. iii. p. 75.

Alligator, *Vulgo*.

DESCRIPTION. The head is elongated, sub-oval, rounded in front, truncated behind, with its sides nearly parallel, only approaching each other about the eighth or ninth superior tooth, and finally meet at "the snout, in a parabolic curve," which makes it resemble the head of a pike, (*Esox*.) The superior surface of the snout is elevated for the nostrils, and the forehead is subdivided by a short, sharp carina into two lateral halves; this ridge is peculiar to the Alligator. The internal and superior border of the orbit is raised into a sharp, prominent ridge, divided anteriorly in two short branches, one of which follows the original direction, and the other is turned towards the lateral margin of the jaw; between these two branches begins a furrow, more or less deep, which is continued nearly one half the length of the muzzle. The occipital region is broad, smooth, quadrilateral, and slightly pointed at its two posterior angles.

The opening of the nostrils are superior near the snout, and directed forwards and upwards; and from the earliest moment, as was observed by Cuvier, are separated from each other by a bony plate, which happens in no other of the Crocodile family. The eyes are large and prominent, the pupil elliptical, black, and the iris pale lemon colour, reticulated with dark brown. There are three eyelids, of which the superior is covered with two large plates and several smaller ones.

The external meatus of the ear is placed on the same line with the orbit, directly behind and near it, and is furnished with two movable lips, one above, the other below, by which it can be closed when the animal is under water and opened when he is on land.

The jaws are slightly curved or festooned at their borders, and armed with forty teeth above and below; of which the fourth inferior pair is largest of all, and received in sockets of the upper jaw when the mouth is closed.

The neck is contracted and covered above with plates, smooth or tuberculated,

four of which are remarkable, each with a strong carina or tubercle, oval at the base and compressed laterally above. These four tubercles are so placed on each side the mesial line, as to make two crests or ridges, with a broad gutter between them. Behind these plates are two others of similar form, but slightly elevated; and on the outer side of these latter again, is a small carinated tubercle over each shoulder. The throat is covered with small and smooth plates.

The body is elongated, rounded above, full at the flanks and flat below. Superiorly it is protected by quadrilateral, strongly tuberculo-carinated plates, disposed in longitudinal and transverse series, forming ridges along the back. Of these longitudinal ridges there are eight, the four internal extending the whole length of the body; the two external on each side are shorter, and the outer is shortest of all. Below these tubercles the flanks are covered with smaller plates, smooth, rhomboidal or oval, and arranged in nine or ten longitudinal rows.

The thorax and abdomen are protected by broad, smooth, quadrilateral plates, large on the belly, less extensive between the anterior extremities, and very small between the posterior. These plates are arranged in longitudinal and transverse series; ten of the former and about thirty of the latter.

The tail is large, long, compressed and thick below, and surmounted above with a double, strongly serrated crest on its anterior, and by a single crest on its posterior half. The vent is a longitudinal fissure, surrounded by many small, smooth plates.

The anterior extremities are large, strong, and covered above by broad, smooth, rhomboidal or quadrilateral plates; and below by plates still smaller, though of similar form.

There are five fingers, the second and third, and the third and fourth, slightly palmate; the three internal only are furnished with nails. The posterior extre-

mities are nearly twice the size of the anterior; they are rounded and covered in the same manner, but with larger plates. The tarsus is flattened and sustains four toes, the three external semi-palmate, and the three internal armed with nails.

COLOUR. The whole superior surface of the Alligator is dusky in the old animal, but in the young it is banded with dirty yellowish-white, most remarkable on the tail. The throat is yellowish-white; the plates of the abdomen are straw colour on their posterior half and dusky on their anterior, lightest in the young animal. The tail is coloured below like the belly, but still more dusky.

DIMENSIONS. Length of head, 14 inches; length of body, 3 feet 1 inch; length of tail, 5 feet; total length, 9 feet 5 inches. The Alligator, however, frequently reaches dimensions much greater; I have seen one in Carolina $13\frac{1}{2}$ feet long. Bartram says in Florida they exceed the length of 23 feet, a size almost incredible.

HABITS. Alligators abound in the low, stagnant ponds and deep morasses of the southern states, where hundreds of them can be seen at a time, either on the flat marshy banks of creeks and rivers, or on sandy or muddy shores left dry by the ebb of the tide. Here they remain motionless for hours, apparently asleep, and are often mistaken for logs of dead and decaying wood, as well as from their colour as from their perfect immobility; but when disturbed by the approach of enemies, they suddenly retreat to the water. At other times they may be observed floating on the surface of the water and only directed by its current; suddenly they skim along with the greatest velocity, either in search of food or of their mate.

Such Alligators as dwell in ponds and streams out of the influence of tide-water, wander much further from the banks, and are not unfrequently seen a mile or more from water; this happens, however, most commonly when they migrate for some reason or other from one pool to another.

The Alligator in his native state is exceedingly voracious, and feeds on any animal substance that may fall in his way; though he seems mostly attracted by fish, and by other animals in motion, as minks, musk-rats, dogs, &c., so as to render it almost impossible for them to cross even small streams without danger, at certain seasons of the year. These the Alligator seizes, drags under water, suffocates, and conveys to his lair, to be devoured at leisure.

Having no prehensile organs but the mouth and strong teeth with which they seize their prey, drag and retain it under water, and breathing as they do, only atmospheric air, and with lungs, it follows that they might as soon be suffocated, when thus submerged, as their struggling prey. A curious arrangement of the soft palate prevents this; it hangs down to meet a broad cartilaginous plate that projects upwards from the lingual bone, so as to close completely the fauces, (in which the trachea is placed,) when the mouth is widely opened, and effectually prevents the introduction of water to the lungs, which would cause the death of the animal.

Alligators are said to lie in wait for their prey on the banks of creeks and rivers, and when it approaches, they sweep it into the water with their tail; and it is certain that the animal uses the tail in defence, striking with it the enemy, and turning the head to the same side, at the same instant, so as to represent nearly a circle; further than this it cannot be carried, in consequence of the extreme length of the transverse processes of the cervical vertebræ.

The Alligator takes the hook readily enough, when baited with flesh, but it requires strong tackle, such as is used in shark-fishing, to secure them, so great is the strength of an adult animal. When taken, they emit a disagreeable odour of musk, which proceeds from glands placed under the lower jaw. These glands are sometimes preserved and used as a substitute for musk in perfumery.

Besides the natural food of the animal, there is at all times found in the stomach of the Alligator, various extraneous substances, as stones, pieces of

wood, fragments of glass, broken bottles, &c., and these latter have their angles rounded, probably by trituration with other hard substances. Many persons suppose these foreign matters are destined to keep the stomach distended, during the long fast the animal undergoes in winter: others think they aid digestion, as particles of gravel operate in the gizzards of birds. It is not easy to say what may be the precise use of these foreign substances found in the stomach of the Alligator, but there can be little doubt of their subserviency to the function of digestion, when it is remembered that they are universally present in the adult, and most commonly also in the young animal.*

The Alligator is much more timid than is commonly supposed, at least when on land; even Catesby says "it seldom attacks men and cattle, yet it is a great devourer of hogs." There is, I believe, no well authenticated instance with us in Carolina, of their having preyed on man; yet Lacoudrenière (*Journal de Physique*) says it often happens in Louisiana, and that they greatly prefer the flesh of the black to the white!! Alligators will, however, defend themselves boldly when on land and at certain seasons of the year; nor can they be made to retreat from their position, as I have more than once observed, yet on these occasions I have never known them the aggressors. Bartram gives a different account; he says, they are very ferocious, and that he "was nearly devoured" by one; his description should however be received with some caution; and yet, perhaps, the encroachments of man upon their dwelling-places, since Bartram wrote, may have rendered them more timid and distrustful.

The Alligator moves but slowly and with difficulty on land, in consequence of the shortness of the extremities compared with the great length of the body. He raises himself on his legs, advances for a short distance, dragging along the thick, heavy tail; now he falls upon the belly, apparently to rest for a time, before he proceeds on his journey. In water, however, he moves from place to place with great velocity, being propelled by his broad, strong, fin-like tail: besides, the

* Vid. description of the stomach in the anatomical part of this work.

peculiar structure of the heart—the large lungs—the nostrils closed with valves, make him eminently aquatic, and enables him to remain for a long time beneath the surface without injury. “Some of the organs of sense even are constructed to receive impressions under water as well as on land: thus the ear is covered with two movable lips, which are closed in one instance and separated in the other, as the impression is to be made by elastic or liquid fluids.”

The female Alligator mounts small sandy hillocks, or she constructs small mounds, with mud and vegetable substances, in which she deposits her eggs; these are hatched by the heat of the sun in about thirty days. As soon as the young are disengaged from the shell, they seek the water “and shift for themselves,” the parents taking no further care of them, though they may remain for some weeks in the same locality. Bosc says he once captured several young Alligators and preserved them for a time, and that their only food was insects, and to them they were not attracted unless they were in motion: I have never seen Alligators take any food whatever in confinement.

In the spring of the year and early summer months, and during the time of incubation, and especially on cloudy days or in the evening, Alligators make a great noise; their croak is not unlike that of the bull-frog, but louder and less prolonged; Bartram compares it to distant thunder!

On the approach of winter, these animals seek out holes in the earth, where they remain torpid until spring, or until the warmth of the weather excites them again to life and activity. In this state of hibernation, many are dug out of their retreats by the slaves, who esteem the tail as an article of food, and which, indeed, is tolerable.

GEOGRAPHICAL DISTRIBUTION. The Alligator is first observed on the Atlantic border of the United States at the mouth of the Neus river, in North Carolina; those that are occasionally seen farther north, must be considered as stragglers rather than permanent residents. From this point they abound near the mouths

of all the creeks and rivers that empty into the Atlantic ocean, or into the Gulf of Mexico, as far as New Orleans, ascending up the Mississippi as high as the entrance of Red river, six hundred miles. Cuvier, in his "Mémoire" on the Crocodiles, says, "Cette espece (Lucius) va assez loin au Nord; elle remonte le Mississippi jusque à la rivière rouge."

Dumeril and Bibron give the Alligator a still wider range; they say it apparently inhabits all parts of North America—"Qu'elle semble habiter dans toute son étendue,"—a striking proof of the inaccuracy of foreign herpetologists in arranging the geographical limits of our reptiles. In fact, the Alligator is never found north of lat. 35° on the Atlantic shore, and does not even reach the same parallel on the Mississippi, but stops at 33° 50", the entrance of Red river—and what is this to the whole extent of North America? It may safely be affirmed, that nine-tenths of the territory of the United States east of the Rocky mountains, is uninhabited by this reptile.

GENERAL REMARKS. Catesby first described this animal, and gave a tolerable figure of it, under the name Alligator, in his "History of Carolina," &c. Linnæus next reviewed it in the twelfth edition of the "Systema Naturæ," but he seems to have regarded it but as a variety of the Nilotic crocodile, in which opinion he was followed by many naturalists of that time. In fact, the elder herpetologists "are in some degree excusable for their ignorance of the different species of Crocodiles, for the specific characters applied to them were variable, and often little accordant with nature."

It is to Cuvier that we owe nearly all that is worth knowing on this subject; it was he who first observed the differences of the Crocodiles of the old and new world. In a "Mémoire" read before the Institute of France, and afterwards published in Weidmann (Archiv. Zoot., b. ii. p. 161, Brunswick, 1801), he recognised the peculiarly shaped head of the Alligator—"flat, and resembling that of the pike"—and seems to have regarded it as distinct from the South American animal;

yet he observes that further observations of several individuals will be necessary to determine if it be really a distinct species.

Daudin next published an account of our animal in his *Natural History of Reptiles*, (1802,) under the name *Crocodylus Mississippiensis*, the description being taken from a "specimen killed on the borders of the Mississippi," and furnished him by Michaux the botanist. Cuvier having completed (1807) his most interesting observations on this family of animals, now described the Alligator as a new species, in the "*Annales du Muséum*," under the name "*Alligator lucius*," from the shape of the head resembling that of the common pike of Europe, (*Esox lucius*.)

This specific name, although perfectly appropriate, so far as regards the form of the head, cannot be retained, as that of *Mississippiensis*, imposed by Daudin, has the undoubted right of priority. Dr. Leach, an excellent English naturalist, afterwards reproduced this animal in his *Zoological Miscellany* as a new species, and dedicated it to Cuvier (*Crocodylus Cuvieri*), which specific name is liable to the same objection as that imposed by Cuvier himself; it is subsequent to that given by Daudin.

There exists some doubt as to the etymology of the term Alligator, by which the animal is now universally known; some have supposed it derived from the word "Legateer" or "Allegater," a name by which the young Crocodile is distinguished in some parts of India. Cuvier says it is much more probable that it is a corruption of the Portuguese "Lagarto," derived from the Latin "Lacerta," as Hawkins writes it "Alagartos;" and Sloan, in his *History of Jamaica*, spells it "Allagator."

FAMILY. IGUANIDA. *Dumeril et Bibron.*

CHARACTERS.

1. The body is covered above with horny plates or scales, which are without knobs or tubercles; most commonly, however, there is either a dorsal or caudal crest. The abdomen is covered with small plates.
2. The head is destitute of large plates.
3. The eyes are furnished with two movable lids.
4. The teeth are placed sometimes in a common socket or groove; at others, they are not set in the bone, but only united firmly to its free border.
5. The tongue is thick, fleshy, flattened, and covered with papillæ; is destitute of a sheath at its root, and is only movable at its tip.
6. The fingers and toes are free, distinct, of unequal length, and are all furnished with nails.

The family Iguanida, according to Dumeril and Bibron, includes about forty-six genera, arranged in two sub-families or sections.

- I. Teeth mostly conical, and received in a cylindrical groove of the jaws.

II. Teeth solidly united to the most prominent part of the jaws, which offer no groove.

Four genera only of this family are found within the limits of the United States, viz: *Anolius*, *Tropidolepis*, *Crotaphytus* and *Phrynosoma*. The three first include each one species, and the latter four.

ANOLIUS.—*Cuvier. Dumeril et Bibron.*

GENUS ANOLIUS.—CHARACTERS. Head elongated, flattened and covered above with polygonal plates of unequal size, maxillary teeth variable in number and form; the anterior simple, rounded, pointed and recurved; posterior compressed, and tridentate at their summit; palatine teeth very small, or wanting altogether. Tongue thick, slightly notched at its apex; throat furnished with a dewlap or fold of skin, distensible at will. Body elongated, sub-cylindrical, more or less flattened, covered above with small scales of variable form, carinated or smooth, imbricated in some, juxta-posed in others; abdomen covered with imbricated scales, smooth or carinated; extremities well developed; third and fourth finger of same length; fourth toe longest; skin of four external fingers and toes developed beneath to form an oval disk, covered with large imbricated scales on their inferior surface; this dilatation most remarkable under the three middle fingers and toes. Tail cylindrical and very long.

Only one species of *Anolius* has hitherto been observed in the United States.

REMARKS. The most remarkable structure in the genus *Anolius*, is the great development of the anterior and inferior part of the ante-penultimate phalanges of the fingers and toes into an oblong oval disk, by means of which the animal can sustain himself, or even run with facility on perpendicular surfaces. Home supposes that a vacuum is produced in these disks, under the fingers and toes, at the will of the animal, and that he is thus kept in place by atmospheric pressure, like some insects, (*Cymbex lutea*.)

The genus *Anolius* exhibits another curious arrangement in its loose skin under the throat, generally folded, but capable of great distention at will, when it forms a dewlap of brilliant colours.

Most naturalists have supposed that this dilatation was produced by inflation, or the passage of air into the sac or fold, and hence has this been given generally as one of the generic characters.

Mr. Bell, a celebrated herpetologist of London, was the first, I believe, who observed the real cause of this distention of the skin at times under the throat, and demonstrated that it was not by inflation or filling the fold of skin with air, as there is no communication with the dewlap and the trachea, fauces or mouth, by which air could enter. The fold of skin is drawn down by a peculiar arrangement of the lingual bone, and a singular elastic cartilage fixed to it and attached to the skin. These parts are moved by delicate muscles, so that when the cartilage is drawn down, the skin of course is distended, and follows it in "the same way that the silk is stretched over the whalebone of an umbrella."*

In fact, the skin, when distended in life by the animal, does not resemble the inflated vocal sacs of the toad or frog, which are round, but looks like a fold of the skin, pinched and drawn down, the two portions being in contact, like a true dewlap.†

* Zool. Jour., vol. ii. p. 11.

† Vide anatomical portion of this work.



Anolis Carolinensis.

J. Quoy del.

T. S. Murray, Lith. Phila.



ANOLIUS CAROLINENSIS.—*Cuvier*.

Plate

CHARACTERS. Head flattened, and greatly elongated, covered with minute scales; nostrils distant from the end of the snout; tail very long, verticillate; a distensible fold of skin, or dewlap, under the throat; fingers and toes slender, elongated, distinct.

SYNONYMES. *Lacerta viridis Carolinensis*, *Catesby*, *Carolina*, &c., vol. ii. tab. lxxv.

Anolis bullaris, *Daudin*, *Hist. Nat. des Rept.*, tom. iv. p. 69.

Green Carolina Lizard, *Shaw*, *Gen. Zool.*, vol. iii. p. 243.

Anolius Carolinensis, *Cuvier*, *Reg. An.*, tom. ii. p. 50.

Anolius bullaris, *Harlan*, *Jour. Acad. Nat. Scien.*, vol. vi. p. 16.

Dactyloa bullaris, *Wagler*, *Natürlich. Syst. der Amphib.*, p. 148.

Green Lizard, or Chameleon, *Vulgo*.

DESCRIPTION. The head is much elongated, flattened, and canaliculated between the orbits, full and rounded at the temples; the snout is rather obtuse; the nostrils are placed at some distance behind its extremity, and open upwards and outwards. The head is mostly covered with small, nearly equal sized, polygonal plates, with a few larger ones, eight or nine in number, disposed in a semicircle on the superior orbital margins, which are somewhat prominent; those on the occipital region are smallest of all, and surround a single plate of larger size. The mouth is large; the upper jaw is armed with fifty or sixty teeth, and the lower with forty-five or fifty; in both jaws the six or eight posterior teeth are the larger; the labial plates are small, quadrilateral, and sixteen or eighteen in number.

The eyes are rather small, but very brilliant, with a dusky pupil and an iris of burnished gold; the external meatus of the ear is contracted and small—the tympanum is visible, though deeply placed. Under the throat is a dewlap, or fold of skin, that can be distended at will.

The body is elongated, but hardly cylindrical, the abdomen being broader and the spine narrower, giving it at times a triquetrous form, and is covered with scales so extremely minute, as to give the whole surface a granulated appearance. When examined with a glass, they appear nearly of equal size, hexagonal, or rounded, not carinated, except over the thighs, but rather more elevated in their centre. There is neither cervical, dorsal or caudal crest. The abdomen is covered with ovalo-hexagonal plates, slightly imbricated and carinated. The extremities are covered above with small, imbricated and carinated scales, and with plates similar to those on the back below.

The anterior extremities are rounded; the skin on the under surface of the antepenultimate phalanges of the four external fingers is spread out into an oval disk, with transverse scales, by means of which the animal can attach itself to smooth surfaces; the fingers are five in number, each provided with a small, short, very delicate and curved nail. The posterior extremities are longer, and terminate in five toes, provided with the same number of nails; the antepenultimate phalanges are arranged in the same manner as in the fingers. The tail is cylindrical, very long, and covered with large rhomboidal and verticillated scales.

COLOUR. The whole superior surface of the head, body, tail and extremities is of a beautiful golden-green; the abdomen, greenish-white; the sac under the throat becomes vermilion when inflated; when flaccid it is white, with occasional lines and spots of red. The inferior surface of the extremities is white, clouded with green; the superior surface of the fingers and toes is brown, and the inferior surface of the same colour. We observe frequently a black band on the temple, and a row of small black dots along the superior surface of the tail, as repre-

sented in the accompanying plate; but these all disappear when the animal assumes its greenest tint.

In giving this as the ordinary colour of the *Anolius Carolinensis*, it must be remembered that the colour varies greatly at different times, according to the season of the year, the weather, health of the animal, activity of the circulation, &c. In cold weather, and in confinement, it is frequently dark brown, or brown with a vertebral line of white, seeming an entirely different animal; in warm weather it assumes, in the space of a few moments, every variety of shade, from dark brown to the most beautiful golden-green. These variations in the colour are so great, and take place so suddenly, that it is often supposed to depend on the will of the animal, or the colour of the substance on which it is placed.

DIMENSIONS. Length from the tip of the snout to the vent, $2\frac{3}{4}$ inches; length of tail beyond the vent, $4\frac{1}{2}$ inches; total length, $6\frac{1}{4}$ inches.

GEOGRAPHICAL DISTRIBUTION. The *Anolius Carolinensis* is first seen about latitude 35° in the Atlantic States, whence its range extends to the Gulf of Mexico, and westward to the Mississippi; and, according to Dr. Sibley, as far as Natchitoches, on Red river.

Too much attention cannot be paid to the geographical distribution of animals, as no species can be considered as thoroughly known until we are acquainted with all its localities, as well as its habits.

It is from inattention to the geographical distribution of animals, that some of the best zoologists of our day have been led into error, and described animals as existing in countries where they are never seen. Thus Dumeril and Bibron, having received specimens of the *Anolius Carolinensis* from Georgia, and also from Milbert, then a resident at New York, say they have reason to believe it is found in a great part of the United States—and so it would be did it exist in the intermediate country between New York and Savannah; but in truth its

limits are among the most circumscribed of all our animals; it is not found farther north than lat. 34°, and consequently not within six hundred miles of New York; and its southern limit being the Gulf of Mexico, it follows then that four-fifths of the United States is not inhabited by this animal. Milbert received his specimens from the south, and afterwards sent them to Paris.

Again: they say they have received a *Cyclurus* from the same source, and suppose it to be common in our country, where, perhaps, never were seen half a dozen living animals of that species, and they were all brought from Cuba, and other West India islands, which is its native country.

HABITS. The *Anolius Carolinensis* is a bold and daring animal, haunting out-houses and garden fences; and in new settlements it even enters the houses, walking over the tables and other articles of furniture in search of flies. It is very active, climbing trees with great rapidity; and leaping with ease from branch to branch or from tree to tree, securing itself even on the leaves, by means of the oval disks of the fingers and toes, which enable it also to walk easily on glass, and on the sides and ceilings of rooms. It feeds on insects, and destroys great numbers, seizing them suddenly, and devouring them, unrestrained even by the presence of man.

In general they hibernate later than other animals of the same class; their favourite retreats being gardens and old buildings; they often retire to green-houses or conservatories, where they may be frequently seen active, even in winter, but never of that rich yellow-green as in the summer season. In the spring season they are extremely quarrelsome; two males seldom meet without a furious battle, which frequently results in the loss of part of the tail, or some other injury, to one or both of the combatants.* Before the contest, the animal

* Le Père Nicholson, in describing the *roquet*, an animal supposed for a long time to be identical with ours, has very well described the habits of the Carolina *Anolius*. *Essai sur l'Hist. Nat. de Saint Domingue*: Paris, 1776, p. 348.

usually remains stationary for a moment, elevates and depresses its head several times, distends his dewlap, which now becomes of a bright vermilion, and then suddenly springs at his enemy. After the first heats of spring have passed, they become less quarrelsome, and many are seen quietly living together in the same neighbourhood; they retain at all times the habit of distending the dewlap, even when quietly basking in the sun; and at those times the colouring of the animal has the liquid brilliancy of the emerald.

GENERAL REMARKS. Catesby was the first who described this animal, under the name of Green Lizard of Carolina,* but he also gives another plate of a similar Lizard of Jamaica.† Linnæus describes the Jamaica species (*Lacerta viridis Jamaicensis*) as the *Lacerta bullaris*, and without further reference. Daudin and succeeding writers give an additional reference to the Green Lizard of Carolina; which is the more remarkable, as Catesby himself seemed aware of the difference between these animals, for he gives them different figures, and a different geographical distribution. Cuvier was the first since Catesby to recognise the Carolina *Anolius* as a distinct species, “from the very long, flat muzzle and the black band at the temples.” It has already been remarked that this band disappears when the animal assumes its greenest tint; we must therefore depend on the “long flattened muzzle,” and the distance of the nostrils from the snout, chiefly, in determining this species.

Dumeril and Bibron suppose this animal to be common in Cuba; and Cocteau has given a figure and description of the *Anolius Carolinensis* in Ramon de Lasagra’s “Histoire de l’Isle de Cuba.”

Now, if the colours of that plate were taken from a living specimen, and are true to nature, the animal certainly is not identical with ours. In Cocteau’s figure, the shoulders and neck are represented as indigo-blue, a colour never seen in any part of the *Anolius Carolinensis* with us. Again, the sack or dewlap is

* Catesby, Carolina, &c., vol. ii. tab. 65.

† Catesby, loc. cit., vol. ii. tab. 66.

coloured cinereous, with a few interrupted white lines, while, in our animal, the same part is always either white, with a few spots and lines of red, or of a beautiful vermilion.

Besides, in Cocteau's description,* "the scales are carinated on the back and sides," and there is a cervical crest, "carina cervicali humili,"† while our animal is entirely ocarinate, &c.

* Loc. cit., p. 127.

† Reptilia, tab. xi.



Tropidolepis undulatus.

H. Richard, del^a

P. S. Duval, Lith. Phil^a

TROPIDOLEPIS.—*Cuvier. Dumeril et Bibron.*

GENUS TROPIDOLEPIS.—**CHARACTERS.** Head short, sub-triangular, rounded in front, and covered with small plates; no palatine teeth; tongue obtuse in front, slightly notched, covered with minute papillæ; lips furnished with a double series of oblong plates; nostrils open in a single plate, surrounded by smaller scales; tympanum depressed in the meatus, which has its anterior border more or less dentated; neck below smooth, but with an oblique depression on each side; body short, depressed, and covered with large, carinated and imbricated scales above, and with smooth plates on the abdomen; tail very long, large, and depressed at its base, rounded towards its tip; neither dorsal nor caudal crest; there are femoral, but no anal pores.

TROPIDOLEPIS UNDULATUS.—*Bosc.*

Plate IX.

CHARACTERS. Head short, sub-triangular, rounded in front; body short, thick, depressed, covered with carinated and imbricated scales, and marked with transverse undulating black bands.

SYNONYMES. *Stellio undulatus*, *Latreille*, Hist. Nat. Rept., tom. ii. p. 40, MSS. from *Bosc.*

Agama undulata, *Daudin*, Hist. Nat. des Rept., tom. iii. p. 384.

Uromastix undulatus, *Merrem*, Versuch eines Syst. der Amphib., p. 57.

Stellio undulatus, *Bosc*, Nouv. Dict. d'Hist. Nat., tom. xxi. p. 527.

Lacerta fasciata, et *hyacinthina*, *Green*, Journ. Acad. Nat. Scien. Philad., vol. i. p. 349.

Tropidolepis undulatus, *Cuvier*, Reg. An., tom. ii. p. 38.

Tropidolepis undulatus, *Gray*, in Griff. An. King., vol. ix. p. 43.

Agama undulata, *Harlan*, Med. and Phys. Res., p. 140.

Tropidolepis undulatus, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. iv. p. 298.

DESCRIPTION. The head is short, sub-triangular, rounded in front, elevated above and covered with rough imbricated and polygonal scales. The snout is obtuse; the rostral plate pentagonal and elongated, with several small plates between it and the nasal and frontal; the nasal plates are single on each side, nearly semi-circular, and are surrounded by five or six small plates. The nostrils are lateral, but open upwards and backwards, and are very near the snout, on the inner margin of the superciliary ridge. There are about ten frontal plates, the central longest; of the two vertical plates, the anterior is the larger, pentagonal and bordered with small plates; the occipital plate is broad, rounded behind, angular in front, and surrounded by six smaller scales, arranged in two rows. There are five superior orbital plates, most extensive in the transverse direction; these have an inner margin of small scales, and an outer border, consisting of three rows of small scales, forming the margin of the superciliary ridge: the eyelids themselves are covered with minute scales. The margin of the upper jaw is covered with six or seven narrow, oblong, quadrilateral plates, nearly all of the same size; above these are two or three rows of small scales.

The eyes are small and black, and appear sunken, from the projection of the superciliary ridge. The external meatus of the ear is large and oval, most extensive in the vertical direction; and in front appears serrated, from the projection of the points of three or four scales. The neck is contracted and short, and has on each side in front of the anterior extremities a deep oblong depression, covered with a fold of skin.

The body is elongated, though full, large, rounded, and covered above with small hexagonal, strongly carinated scales; each carina terminating posteriorly in a sharp, elongated point. These carina form sharp ridges, which are directed

longitudinally on the back, but obliquely on the flanks. The abdomen is broad, flattened, rounded at the sides, and covered with rhomboidal, reticulated, and imbricated scales, each scale terminating posteriorly in a point. The scales on the throat and anterior part of the chest are frequently notched behind, instead of ending in a point; those under the chin are very small. The tail is long, cylindrical, and covered with sharp, elongated or imbricated scales, pentagonal or triangular, with their apices rounded, and are verticillated or arranged in circular rows, which renders the tail rough to the touch. The vent is semicircular, transverse, and bordered before and behind with minute scales.

The anterior extremities are rather large and rounded, covered above with scales similar to those on the back, but smaller and smooth below. There are five delicate fingers, furnished each with a very small, short and curved nail. The posterior extremities are nearly twice the size of the anterior, and are covered with similar scales, with a range of sixteen or eighteen pores on the inferior surface of the thigh; behind these are numerous small scales that make a sort of ridge. There are five toes, long, slender, and scaled to the root of the nails, which are short and curved.

COLOUR. The head is dark brown above, with a black bar extending from orbit to orbit; behind this is a dusky white bar of similar extent. The neck above is dark grey; behind the tympanum are two or three scales, with their margins of bright red. The lower jaw is silver-grey; the throat black, with a broad green blotch ascending, to be visible on the side of the neck, sometimes interrupted in the mesial line.

The body is pepper-and-salt grey above, with five or six transverse black bands, not of equal breadth in all parts, and having their posterior borders marked with white blotches, which frequently become continuous, so that their posterior margins appear tipped with a white edge. The abdomen is silver-grey, marked with small, oblong, black spots; these are so disposed near the centre as to form an interrupted line, which is most distinct between the thighs.

On each side of the abdomen is a long green blotch, surrounded with black, which runs to the anterior extremities; and the lighter central portion of the abdomen, meeting the lighter line extended from the inferior surface of the anterior extremities, forms a cross on the thorax.

The tail is dusky, with several transverse bands of black.

The anterior extremities are dusky above, with transverse bands of black even to the toes, with a few white spots on their anterior and posterior surface; the under surface is silver-grey. The posterior extremities are coloured like the anterior, both above and below.

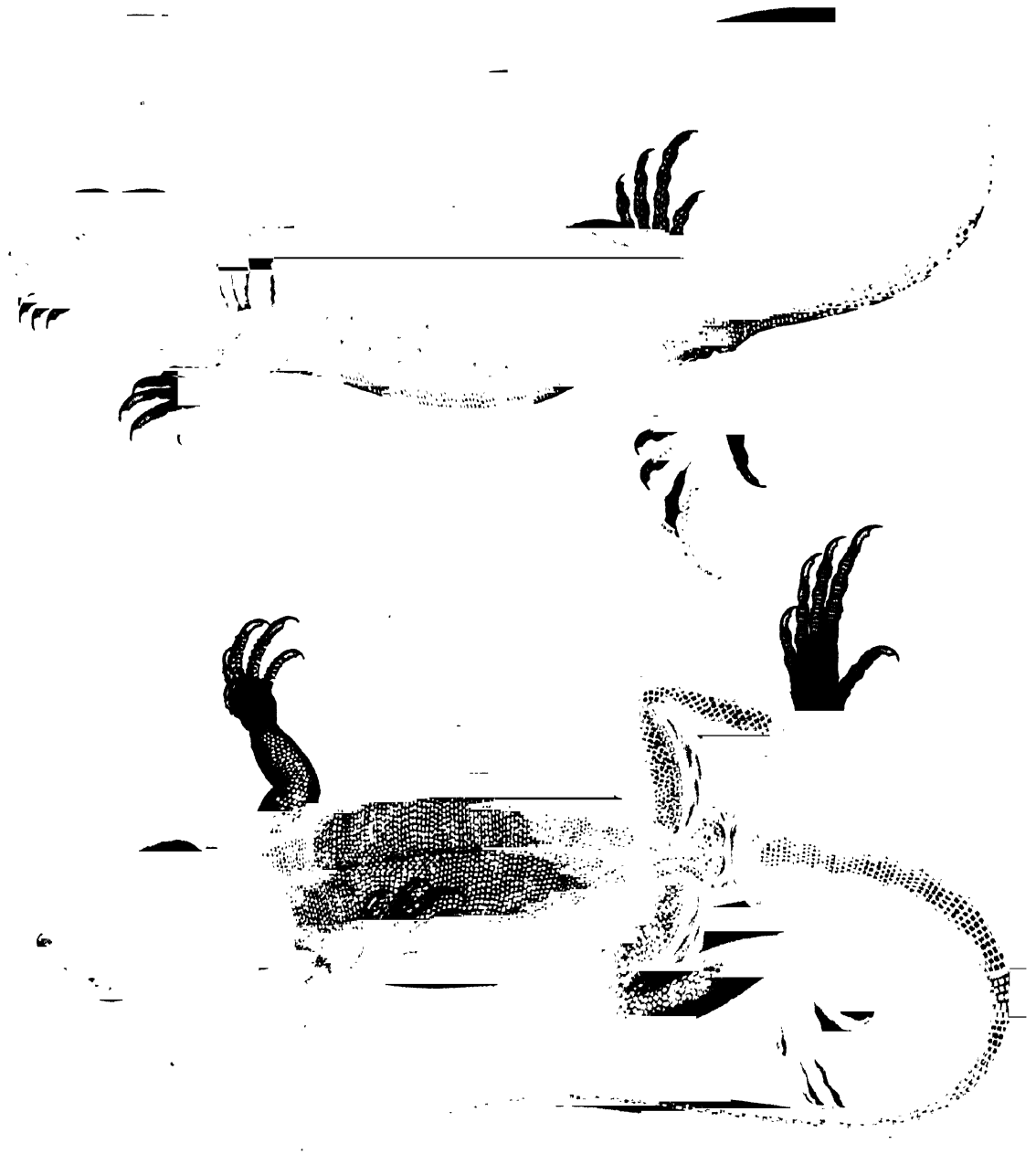
DIMENSIONS. Length of head, 7 lines; length of body, 3 inches 3 lines; length of tail, 4 inches; total length, 7 inches 8 lines.

HABITS. The *Tropidolepis undulatus* inhabits chiefly the pine forests of our country, and is often found under the bark of decaying trees; it chooses also commonly old fences as its basking place. It is exceedingly rapid in its motions, climbing with great facility to the tops of trees, and is hence not taken alive without great difficulty. Its food is insects, especially such as are found under decayed wood.

GEOGRAPHICAL DISTRIBUTION. The *Tropidolepis undulatus* has a very extended geographical range. It is abundant in the forests of New Jersey, and is found even as far north as latitude 43°, whence it reaches the Gulf of Mexico along the Atlantic States; and is also common west of the Alleghany mountains, as I have seen individuals of this species from Mississippi, Louisiana, and Arkansas; and Say observed it at Engineer Cantonment, on the Missouri river.

GENERAL REMARKS. There can be no doubt that this animal was first observed in Carolina by Bosc, who, in his notes furnished to Latreille and

Daudin, describes it under the name *Stellio undulatus*, as Latreille first published it, though Daudin afterwards arranged it as an *Agama*. Cuvier placed it in the genus *Tropidolepis*, in which he has been followed by Dumeril and Bibron, who have recently so well described the animal as to leave nothing to be desired.



Crotaphytus collaris

CROTAPHYTUS.—*Holbrook.*

GENUS CROTAPHYTUS.—CHARACTERS. Head large, sub-triangular, rounded at the snout and greatly developed at the temporal region; covered above with small polygonal plates; largest on the vertex maxillary, palatine and sphenoidal teeth; the posterior maxillary compressed laterally, and tricuspid at their cutting margin. Body covered with small, polygonal, smooth plates; tail very long, covered with oblong-quadrate plates, verticillated, larger than those of the body, smooth on its anterior half and carinated on its posterior; femoral pores well developed.

CROTAPHYTUS COLLARIS.—*Say.**Plate X.*

CHARACTERS. Head short, thick, sub-triangular, rounded at the snout, arched at the forehead, broad at the temples; covered above with small polygonal plates, largest on the vertex and occiput; eyelids serrated at their margins. Body elongated, depressed, dusky, with a deep tinge of green or purple, spotted with rays of white colour; two transverse black bars between the shoulders, with an intermediate one of white; tail very long, covered with verticillated plates, smooth on the anterior, carinated on the posterior half; femoral pores well developed.

SYNONYMES. *Agama collaris*, *Say*, Long's Exped. to Rock. Mount., vol. ii. p. 252.

Agama collaris, *Harlan*, Med. and Phys. Res., p. 142.

DESCRIPTION. The head is short, thick, and sub-triangular, with the snout rounded; the forehead arched above, sloping suddenly downwards, and with the temporal regions swollen or greatly developed; the forehead, vertex, and occiput are covered with numerous small polygonal plates, smooth, and all nearly of the same size, becoming only a little more minute as they approach the nostrils and margin of the upper jaw. The superior face of the orbit is covered with many small polygonal plates, disposed without order in general, but on the outer margin is a row of scales distinct, though not of larger size.

The nostrils are placed on a line with the superciliary ridge; they are lateral, large, open in a single plate, which is somewhat elevated, so as to make them appear slightly tubular, and are surrounded by several small plates; the openings are rather large and are directed upwards, outwards and backwards.

The upper jaw is covered with twenty-four small, quadrilateral, labial plates, above which are two or three rows of smaller plates, though of nearly similar form. The rostral is quadrilateral, greatly elongated transversely, so as to appear like two ordinary labial plates united in one. The mouth is rather small, and the tongue broad, slightly notched at its tip, and covered with fungiform papillæ. The upper jaw is armed with eighteen teeth; six incisors, two longer canine; the seven posterior being compressed laterally and tricuspid at their cutting margins. The lower jaw has fourteen teeth; and the palate is provided with minute teeth, and there are several rather large, distinct and conical in the sphenoidal bone.

The orbit before, below and behind is bordered with ten or twelve small quadrilateral plates, those below are rather largest, and slightly concave; between these plates and the lids are several rows of minute plates or granulations. Of the eyelids the superior is largest, and both are covered with minute granulations, and have at their tarsal margins a row of quadrilateral plates, larger in the lower, and having a second row of smaller plates attached to their outer border, which makes a remarkably serrated margin. The eyes are rather large, but appear less so

because of the projection of the superciliary border; the pupil is black, round, and the iris silvery.

The external opening of the ear is long, narrow, quadrilateral, most extensive vertically, and surrounded with small scales, of which four or five in front are conical, and project a little backwards, so as to give a slightly notched appearance to the middle of the anterior border. The membrane of the tympanum is visible, though deeply placed, and is extended nearly from without inwards. The chin and throat are covered with small, nearly equal sized plates, smooth, and not imbricated. The neck is contracted, with a transverse fold ascending on each side, in front of the shoulders. The body is large, elongated, depressed, rounded at the flanks, and covered above with small, sub-hexagonal scales, either rounded or a little oblong, neither imbricated nor carinated, all nearly of the same size, and "obsoletely arranged in transverse lines." The thorax and abdomen are protected by larger plates than the back, though still of small dimensions, smallest on the thorax; they are of quadrate form, or slightly sub-hexagonal, imbricated, and are distinctly arranged in transverse series.

The anterior extremities are large, and covered above with small scales, similar to the back, and below with scales still smaller, while in front there are but few larger, variable in form, and imbricated. There are five distinct, well-developed fingers; the third and fourth of the same length, all much compressed laterally, scaled to the roots of the nails by a single transverse row beneath, and by two or three rows above. Each finger is furnished with a nail—small, short, curved, pointed, and much compressed.

The posterior extremities are also large, and covered like the anterior above and below; though the plates are small, they vary much in form; they are smooth, rhomboidal, or sub-triangular, imbricated, and largest on the leg. The tarsus is covered with larger imbricated scales above, and sustains five long, laterally-compressed toes, covered like the fingers, and furnished with nails of similar

form. There is a range of nineteen femoral pores under each thigh, well developed, and with a row of scales larger than common before them.

The tail is more than twice the length of the body, thick, and flattened at its base, but soon tapers, becomes cylindrical and very small; it is covered with oblong-quadrate plates, larger than those on the body, verticillated, smooth on the anterior half, carinated on the posterior to the tip. The vent is transverse, rather semicircular, with a depression behind it, and a row of larger scales.

COLOUR. The head above is uniform dusky brown, tinged with a greenish or purplish hue. The neck beneath is pale; "at the sides it is fulvous, more or less varied with bright vermilion-red" in life, with two deep black bands extending across the shoulders between the anterior extremities, and a broad yellowish-white band between them. The body above is slate-colour, tinged with green or purple, and with five or six dusky, broad bands, tinged with purple, alternating with narrow fulvous bars, each with a series of yellow spots, which are also scattered in the darker parts of the back. The bands on the body disappear altogether in the very old animal, and the whole superior surface is then of a uniform slate-colour, tinged with purple, and studded with light coloured spots. The sides are greenish-yellow; the abdomen is silver-white in the preserved specimen, and clouded at the throat. The extremities and tail are marked with alternate bars of dusky and fulvous.

DIMENSIONS. Length of head, 1 inch 2 lines; breadth of head over temporal muscles, 1 inch 2 lines; length of body to vent, 3 inches; of thigh, 1 inch; of leg, 1 inch 1 line; of tarsus and toes, 1 inch 8 lines; length of tail, 8 inches; total length, 12 inches.

HABITS. I am unacquainted with the habits of this reptile.

GEOGRAPHICAL DISTRIBUTION. It inhabits the south-western portions of the United States, as Arkansas and Louisiana, near the confines of Texas.

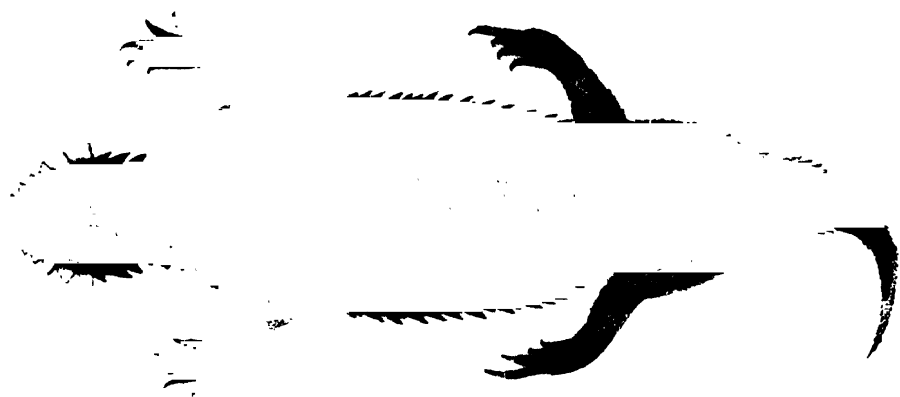
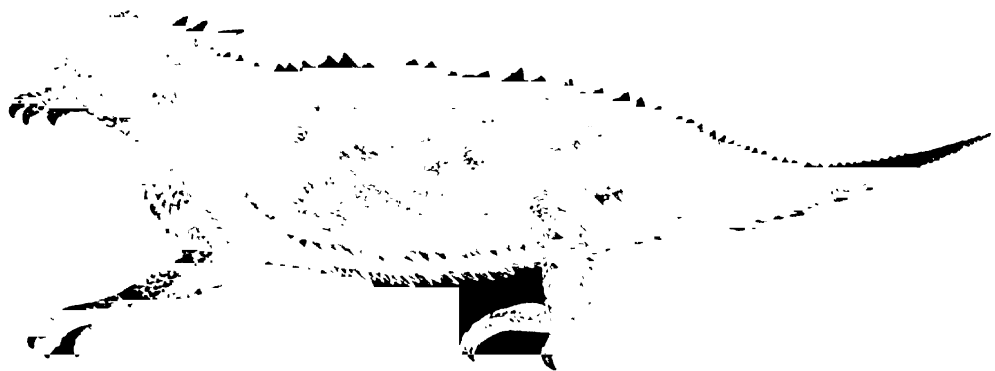
GENERAL REMARKS. This animal was first described by Say, in Long's Expedition to the Rocky Mountains, who calls it *Agama collaris*. Not being able to refer this animal to any one established genera, I have proposed a new genus, *Crotaphytus*.

Never having seen the living animal, the colours of the accompanying plate were taken from a specimen preserved in alcohol, and consequently cannot be fully relied on.

P H R Y N O S O M A .—*Wiegmann.*

Genus PHRYNOSOMA.—CHARACTERS. Head short, rounded in front, bordered at the sides and behind with spines more or less elevated; covered above with small, polygonal, nearly equal sized plates. Nostrils lateral, near the snout, and opening in the middle of the nasal plate; margin of external meatus of the ear simple; tympanum visible but depressed. Throat with a transverse fold; body short, oval, much depressed, with a dentated margin at the flank, and covered above with trihedral tubercles, arising from among small imbricated scales; neither spinal nor caudal crest; extremities short, dentated at their borders; fingers or toes five to each extremity; a range of femoral pores, more or less developed; tail hardly the length of body, and flattened at its base.

REMARKS. To Wiegmann, a celebrated herpetologist of Berlin, is due the merit of having first pointed out the proper place for these animals in a systematic classification. He removed them from the Agamæ, and established the genus Phrynosoma for their reception; and this he subdivided very naturally into two sections, according to the mode of opening of the nostrils, the scales of the belly, whether smooth or not, &c. &c. For further information on this subject consult the *Isis*, vol. xxi., or his *Herpetologia Mexicana*, a work I have read with great interest.



Phrynosoma cornuta.

Sera pinax.

Pl. Duval-Liik. Pl. Pin.

1941

1942

1943

1944

PHRYNOSOMA CORNUTA.—*Harlan*.

Plate XI.

CHARACTERS. Head short, thick, triangular, rounded in front, with a range of long spines on each side of the lower jaw; nostrils open within the internal margin of the superciliary ridge; body short, flattened, rounded, covered with trihedral tubercles, intermixed with small imbricated scales; abdomen flattened, and covered with rhomboidal, carinated scales; femoral pores, but not well developed.

SYNONYMES. *Lacerta tapayaxin*, *Barton*, Med. and Phys. Journ., vol. iii. part ii. p. 68.

Agama cornuta, *Harlan*, Journ. Acad. Nat. Scien. Philad., vol. iv. p. 299, pl. xx.

Tapaya orbicularis, *Cuvier*, Reg. An., tom. ii. p. 37.

Phrynosoma cornuta, *Gray*, in Griff. An. King., vol. ix. p. 45.

Phrynosoma Harlani, *Wiegmann*, Herp. Mex., pars i. p. 54.

Phrynosoma Harlani, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. iv. p. 314.

Agama cornuta, *Harlan*, Med. and Phys. Res., p. 141.

Horned Toad, *Vulgo*.

DESCRIPTION. The head has nearly the form of an equilateral triangle, rounded at the snout, and covered on the vertex with small polygonal scales, all nearly of the same size; the occipital plate is small and sub-round; the remaining parts of the occipital space is covered with small scales and small conical pointed tubercles, sometimes grooved. The rostral plate is small, pentagonal, and rounded above. The nasal plates are single on each side, circular, narrow, surrounded by five or six small polygonal scales, with the opening for the nares nearly in the middle.

The nostrils are very near the snout, latero-superior, and open almost vertically within the internal margin of the superciliary ridge. The eyes are small and sunken, with the pupil black and the iris dark grey. The margin of the upper jaw is covered with about twelve small, quadrilateral, labial plates, all nearly of the same size; the three or four posterior being rather smaller. The upper margin of the lower jaw is covered with about as many labial plates, and of nearly the same size and form; its inferior margin presents a series of six horny points on each side, placed horizontally, and increasing in size from the anterior to the posterior, and give a serrated appearance to the inferior and lateral margin of the lower jaw. Above these points, but below the labial range of plates, are two series of small scales.

At the posterior border of the occiput is a transverse row of prominent spines, nine in number, extending from near the front of one external meatus of the ear to the other; two of these spines are very long, and occupy the posterior border of the occipital region; three are placed externally to these on each side, and decrease gradually in size from above downwards; the ninth spine, which is smallest of all, is situated between the two central or longest: these spines are nearly conical, but are flattened at their bases. The external meatus of the ear is large and oval, most extensive in the vertical direction; this opening is granulated posteriorly, and is a little prominent in front, where there are three or four tubercles, with projecting points.

The neck is very short, which gives the head the appearance of being attached to the shoulders, like the toad. The chin is covered below with small rhomboidal scales; besides these there are two rows of larger and pointed scales running to the neck, within and parallel to the rows of spines that margin the lower jaw, but separated from them by three or four series of small scales. The skin of the neck is slightly folded transversely, but on the sides are larger folds that cover depressions; the most remarkable is placed in front of the shoulder. The borders of these folds are frequently armed with short spines.

The body is short, flattened, ecarinate, rounded at the sides, and covered with trihedral pointed tubercles, intermingled with small, rhomboidal, carinated and imbricated scales. The vertebral line is covered with about four rows of small, nearly equal sized scales, and appears flattened by reason of the absence of the carinated scales and tubercles found in other parts. On each side the vertebral line, and irregularly disposed in rows of four or five each, are seen large pointed trihedral tubercles, surrounded by others of similar form, but smaller. The flanks are arched outward, and present, from the shoulder to the thigh, two series of spines, of which the upper is larger, leaving a groove between them covered with granulations; these spines give a serrated appearance to the flanks. The thorax is covered with large rhomboidal scales, strongly carinated; the scales of the abdomen are also rhomboidal and carinated, but less distinctly, and of smaller size.

The tail is broad and flattened at its root, but soon becomes smaller and terminates in a point, and is covered above with large rhomboidal, imbricated and strongly carinated scales, with a few small spines about its basis; and below with smooth scales. The vent is transverse, and has small scales both before and behind.

The anterior extremities are large, and protected in front and above by large rhomboidal, carinated scales, each carina terminating in a spine, and below they are covered with smooth and smaller scales; the fingers are five, distinct, slender, and furnished each with a small, short and curved nail. The posterior extremities are but little longer than the anterior, and are covered in a similar manner, with the exception of having a few large trihedral spines scattered about the superior and posterior part of the thigh and leg; there are five toes, distinct, long, slender, each armed with a short and curved nail. There are six or eight pores on the inferior surface of the thigh, but not well developed.

COLOUR. The head above is ash coloured, with a dark bar across the vertex; the forehead is dusky, and the margin of the upper jaw pepper-and-salt grey.

The border between the spines, in which the superciliary ridges terminate posteriorly, is margined with black; from the inferior and anterior part of the orbit descends, perpendicularly, a narrow dusky bar; another bar of the same colour, but broader, runs from the inferior and posterior margin of the orbit downwards and backwards to the root of the two anterior and inferior spines of the range surrounding the occiput. These two spines are dirty white, the inferior one margined below with dusky; the two central occipital spines are dark chestnut at their bases, and black at their apices. The chin and throat are silver-white.

The ground colour of the neck and body above is ash, with a line of yellowish-white along the vertebral column, reaching from the head nearly to the extremity of the tail; on each side of this line at the neck is an oblong dark blotch, which extends to the anterior extremities, larger before and smaller behind. The body above is marked with three transverse dark coloured blotches or bands, not however crossing the vertebral line; the anterior is only a dark oblong spot, in the centre of which is a long spine; the basis of this, as well as most of the spines, is surrounded by an irregular circular border of chestnut, with an occasional tinge of yellow; the spines themselves are a darker chestnut; the central and posterior bars are most extensive, but even they only reach the margin of the vertebral line. The thorax and abdomen are silver-white, with small dusky spots, sometimes round, sometimes oval, each including a portion of three or four scales. The tail is coloured above like the back, and is completely banded towards the tip—below it is silver-grey. The anterior and posterior extremities are ash colour above, marked with transverse dusky bars, and silver-grey beneath.

DIMENSIONS. Length of head to root of occipital spines, 7 lines; length of body, from head to vent, $2\frac{1}{4}$ inches; of tail, beyond the vent, $1\frac{1}{4}$ inches; of thigh, 9 lines; of leg, 9 lines; of tarsus and toes, 9 lines; total length, 4 inches 7 lines.

HABITS. The *Phrynosoma cornuta* inhabits the prairies of the west; it moves, according to the accounts of those who have seen them in the wild state, with

great rapidity from place to place, either in search of its prey or to escape its enemies, but never climbs. In confinement, however, its movements are sluggish; it remains for hours in the same posture, without making any attempt to escape. The individual from which the accompanying plate was taken, was brought by Mr. Gregg from the neighbourhood of Santa Fe, near the confines of the United States, and remained in possession of Dr. T. M'Euen, of Philadelphia, for several months. It was perfectly quiet and gentle, never attempting to bite, or even to resist, when taken in the hand, and far from having the activity attributed to it in its native condition; it was not easy to make it shift its position, even by touching it; nor would it seek shelter from rain, or from the intense heat of the sun, though the temperature in the shade was above 90°. Dr. M'Euen further informed me, that it would feed on a small species of red ant, taking them slowly and at long intervals; but he could never entice it to eat other insects, though many different kinds were offered it.

GEOGRAPHICAL DISTRIBUTION. The *Phrynosoma cornuta* is found in the western country, from the Missouri to Texas, and is very abundant about the sources of Red river.

GENERAL REMARKS. A good deal of difficulty has hitherto existed as to the history of the *Phrynosoma cornuta*. The first animal of this species ever seen by our naturalists was brought alive by Lewis and Clark, and given to Mr. Jefferson, who deposited it in the Museum of the Philosophical Society of Philadelphia, where it is still kept in perfect preservation; this I have more than once examined, through the kindness of my esteemed friend, John Vaughan, Esq., librarian to that institution.

Dr. B. S. Barton was, however, the first naturalist who published any notice of the *Phrynosoma cornuta*,* and proposed calling it *Lacerta tapayaxin*—a name that cannot be received, as it is applied to the orbicular lizard of Hernandez.

* Med. and Phys. Journ., vol. iii. part ii. p. 68.

Harlan next described this animal as a new species of Agama, under the specific name cornuta, which must be retained. His description was taken after comparing three specimens in Peale's Museum, also brought from Missouri, all of which I have ascertained, from frequent examination, to be perfectly similar: they all have carinated scales on the abdomen, and all have the nostrils opening within the superciliary ridge.

Wiegmann did wrong in changing the specific name of cornuta first given to this animal by Dr. Harlan, for that of Harlani; especially as he was aware, as may be seen by his reference, that the animal had previously been described as the Agama cornuta. If it were meant for a compliment to our herpetologist, however well he may deserve it, it is badly timed, and is paid at the expense of science; it is taking away a name well applied and significant, and replacing it by another that cannot be continued, but must in the end give way to that first imposed.

Dumeril and Bibron are equally wrong in adopting Wiegmann's specific name, instead of that given by Harlan, which has the undoubted right of priority.



Phytosoma orbiculare.

Same as above.

U.S. Depts. Geol. & Agr. Philad.

PHRYNOSOMA ORBICULARE.—*Hernandez.*

Plate XII.

CHARACTERS. Head short, triangular; snout rounded; lower jaw without spines; the three posterior labial plates large and elevated; nostrils open at the anterior extremity of the superciliary ridge; a pointed tubercle in front of the meatus of the ear; abdomen covered with smooth scales; femoral pores fifteen, very distinct.

SYNONYMES. *Lacerta orbicularis*, *Hernandez*, Nov. Plant. An. Mex., p. 67.

Agama orbicularis, *Merrem*, Versuch eines Syst. der Amphib., p. 53.

Phrynosoma orbiculare, *Wagler*, Natürlich. Syst. der Amphib., p. 146.

Phrynosoma orbiculare, *Wiegmann*, Herp. Mex., pars i. p. 53, tab. viii. fig. i.

Phrynosoma orbiculare, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. iv. p. 321.

DESCRIPTION. The head is short, triangular, the snout rounded, but less so than in the last species, and covered in front and on the vertex with small polygonal plates, and a few small tubercles on the occipital space. The rostral plate is very small, sub-pentagonal; the nasal plates are single, circular, very narrow, and surrounded by five or six polygonal scales. There are about ten small, quadrilateral, very narrow, superior labial plates, which do not extend as far as the angle of the mouth, where their place is supplied by small granulations; the inferior labial plates are similar to the superior in size and number, except the three or four posterior, which are larger, and behind them is placed a conical pointed tubercle at the anterior and inferior margin of the meatus of the ear. The inferior and lateral border of the lower jaw presents an horizontal range of eight large quadrilateral plates, instead of spines, as in the cornuta; these increase in size towards the angle of the mouth, and being slightly elevated in their centre, give a festooned appearance to the inferior and outer margin of the lower jaw;

above these large plates, and below the labial plates, are two or three series of small scales. The whole chin and throat are covered with nearly equal sized, smooth, rhomboidal scales.

The nostrils are near the snout, and open at the anterior extremity of the superciliary ridge. The eyes are small and sunken, with the pupil black and the iris dark grey.

At the posterior border of the occiput is a row of spines, nine in number, extending from the front of one meatus of the ear to the other; the two longest of these spines are placed at the superior and posterior part of the occipital region, and have a very small one between them; three other spines are placed on the sides of the head, and decrease in size from above downwards: these spines are formed like those of the *Agama cornuta*. The external meatus is large, rather triangular, broader above, narrower below, with a small conical pointed tubercle at its anterior and inferior margin. The neck is short, and contracted behind the head. The chin is covered with small, equal sized, smooth, rhomboidal, imbricated scales; the throat with similar scales, but smaller, and offers a transverse fold, which ascends on each side of the neck, to cover an oblique depression in front of the anterior extremities.

The body is short, flattened, ecarinate, arched outwards at the flanks, and covered with large, pointed, trihedral tubercles, interspersed among small rhomboidal, carinated scales and smaller tubercles. The vertebral line is covered with three or four rows of small scales, and appears depressed, from the absence of the larger tubercles that are found in other parts. On each side of the vertebral line, and disposed in irregular rows, are scattered larger and pointed tubercles. The flanks are bordered with a single row of spines, extending from the anterior to the posterior extremity. The thorax and abdomen are covered with rhomboidal, perfectly smooth scales.

The tail is broad and flattened at its root, but suddenly becomes contracted,

and terminates in a point, and is covered like the abdomen, but has only a few spines at its basis and along its lateral margins.

The anterior extremities are of moderate size, and covered above and in front with large, elongated, rhomboidal, pointed scales, and with smooth scales below; the fingers are five in number, slender, distinct, and each armed with a short curved nail. The posterior extremities are but slightly larger than the anterior, and are covered like them, both above and below, with the exception of a few large spines scattered about the upper face of the thigh and leg; there are five toes, long, slender, distinct, and each with a short curved nail.

COLOUR. The head is dusky above, with a dark band between the orbit and another along the posterior part of the occiput. The upper jaw is grey, the lower white. The superior or long spines of the occiput are chestnut at their basis, and black at the points; the others are dusky. The chin and throat is silver-white. The body, tail and extremities above are coloured precisely as in the *Agama cornuta*; below they are silver-white, with oblong or round spots on the thorax and abdomen.

DIMENSIONS. Length of head to root of spines, 7 lines; of body, from head to vent, $2\frac{1}{4}$ inches; of tail, beyond the vent, $1\frac{1}{2}$ inches; of thigh, 9 lines; of leg, 9 lines; of tarsus and toes, 9 lines; total length, 4 inches 7 lines.

HABITS. I am not aware that the *Phrynosoma orbiculare* differs in its habits from the *Phrynosoma cornuta*.

GEOGRAPHICAL DISTRIBUTION. This animal is found in Arkansas and Louisiana, and extends through Texas, Mexico, &c. to the Pacific ocean.

GENERAL REMARKS. There cannot be much doubt that this is the *Lacerta orbicularis*, or *Tapayaxin*, of Hernandez; for his plate, which is tolerably good, represents the scales on the thorax and abdomen as smooth.



Phrynosoma coronata.

Drawn by C. Stuebel

F. S. Davis, Z. M. Philo²

PHRYNOSOMA CORONATA.—*Blainville*.

Plate XIII.

CHARACTERS. Head short, triangular; nostrils open at the anterior extremity of the superciliary ridge; occipital region surrounded with eleven spines; eight rows of large, rhomboidal, elongated and pointed scales under the chin, reaching to the throat, external series largest. Body covered with rhomboidal scales, and large trihedral tubercles; two rows of spines along the flanks, the superior larger; a row of spines on each side the tail, from the root to the extremity.

SYNONYMES. *Phrynosoma coronata*, *Blainville*, *Nouv. Ann. du Mus. d'Hist. Nat.*, tom. iv. p. 284, pl. xxv. fig. 1. a b c.

Agama orbicularis, *Audubon*, *Birds, &c.*, vol. iv. pl. cccxviii.

Phrynosoma coronata, *Dumeril et Bibron*, *Hist. Nat. des Rept.*, tom. iv. p. 318.

DESCRIPTION. The head is short, thick, triangular, and covered on the forehead and vertex with small polygonal plates of unequal size, and with a few scales and elevated tubercles on the occipital region. The snout is short and rounded, with the rostral plate very small. The nostrils are near the snout, open at the anterior extremity of the superciliary ridge, and are directed upwards and a little outwards. The nasal plates are single on each side, circular, exceedingly narrow, and surrounded by six polygonal scales. The superciliary ridge is prominent, projecting over the eye, and covered with five or six quadrilateral plates; posteriorly it is elongated, and terminates in a pointed tubercle. The eyes are small and sunken, with the pupil black and the iris very dark grey. The superior labial plates are eight in number, quadrilateral, very small, and not extending to the angle of the mouth, where their place is supplied by small granulations; there are

twelve inferior labial plates, quadrilateral, and still smaller than the superior. The outer and inferior margin of the lower jaw presents an horizontal series of large tubercles, increasing in size from the chin towards the angle of the mouth; the posterior of these is a little removed from the row, and is much larger, sharply pointed, and placed directly under the angle of the mouth; the other tubercles are not elongated and spinous posteriorly, as in the *Phrynosoma cornuta*, but give only a festooned appearance to the lower jaw. Between these tubercles and the inferior labial plates are three or four rows of small scales.

The chin is covered below, on the mesial line, with one or two rows of small rhomboidal scales; on each side of these are placed four rows of larger scales, greatly elongated, and pointed outwardly and posteriorly, reaching to the throat, and increasing in size from within outwards, the external largest. Beyond these, and within the series of large tubercles that border the lower jaw, are again three or four rows of small scales.

The whole posterior border of the head, from one angle of the mouth to the other, is surrounded by a row of long pointed spines, of conical shape, flattened at their bases, and disposed as in the *Phrynosoma cornuta*, but longer, and more numerous—in general eleven, but I have seen thirteen, the inferior very small. The external meatus of the ear is large, oval, and vertical. The neck is short, contracted behind the head, and protected above by small scales and pointed tubercles. The throat is covered with smooth rhomboidal scales, pointed posteriorly; a transverse fold of the skin ascends on the side of the throat, and covers a depression in front of the anterior extremities, where the border of the fold is furnished with spines.

The body is short, flattened, rounded, and arched outwards at the flanks; above it is protected by small, irregular scales, intermingled with large trihedral pointed tubercles. These pointed tubercles are surrounded at their bases by others of the same form, but smaller, and are irregularly disposed in four rows on each side of the mesial line, as in the *Phrynosoma cornuta*, from which, however, it differs

entirely in wanting the three or four rows of small scales on the vertebral line, in place of which it has large scales and spiny tubercles. The flanks are furnished with a double row of spines; the upper is much the larger, and makes a serrated margin from the anterior to the posterior extremities. The scales on the thorax and abdomen are large, rhomboidal and smooth, terminating posteriorly in a point.

The tail is large, broad, and flattened at the root, but soon becomes smaller, is depressed in its whole length, and covered above with scales and pointed tubercles, as on the back; and below, with large rhomboidal scales, elongated in points posteriorly. On each lateral margin of the tail is a very remarkable range of large trihedral flattened spines, which gives to the tail a strong and regularly serrated border, unlike any other of this genus that I have observed.

The anterior extremities are well developed, and protected in front by large, elongated, rhomboidal scales, carinated and pointed, even to the roots of the nails; their under surface is covered with small, smooth, rhomboidal scales; there are five fingers, distinct and slender, each with a short and curved nail. The posterior extremities are but little larger than the anterior, and are covered in the same way, but have strong spines along the superior and posterior part of the thigh. The toes are five in number, large, distinct, and furnished each with a short and curved nail. On the under surface of the thigh is a range of sixteen or eighteen pores.

COLOUR. The head above is light brown, with a few dusky blotches; the upper jaw is grey. The three inferior spines that surround the head are light, and the two central spines are dark chestnut. The ground colour of the neck and body above is pepper-and-salt grey, with a lighter vertebral line from the occiput to near the extremity of the tail, but frequently interrupted by transverse dusky bars; nor is it perfect in other parts, as it contains several spines, which are all dark; on each side of this line at the neck is an oblong dark chestnut blotch, reaching to the shoulders, broad before and narrow behind. Behind these are four bands, with irregular margins, which traverse completely the vertebral line, but are there less

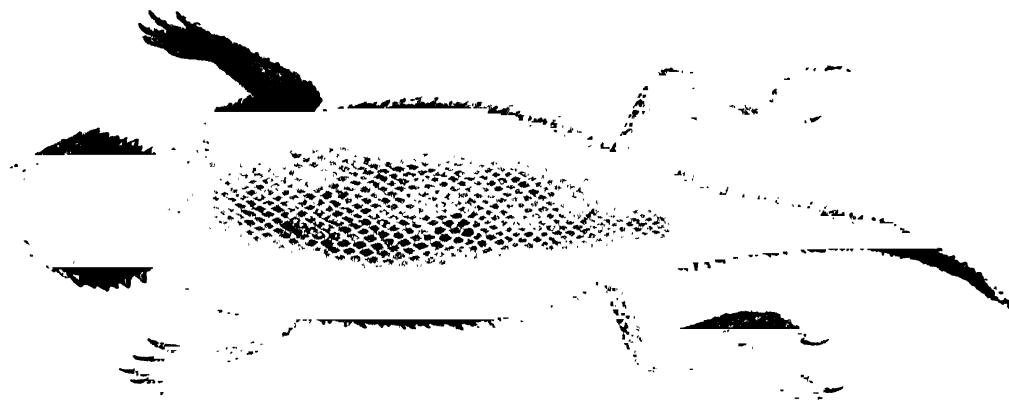
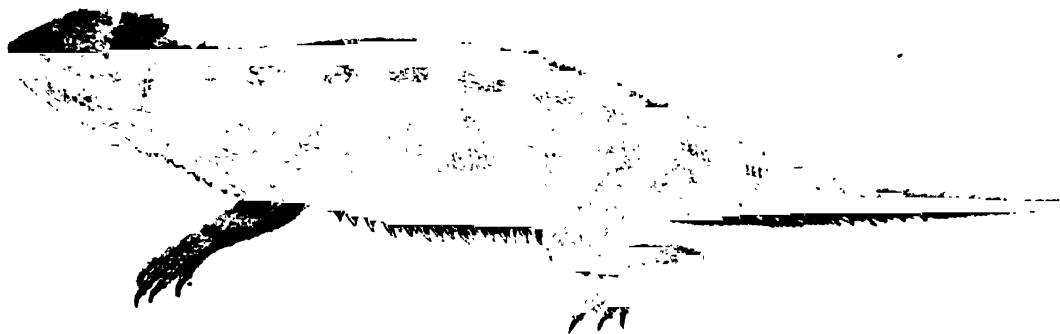
evident. The throat and abdomen are yellowish-white, marked with large dusky blotches, frequently confluent. The tail is coloured like the back above, but is more completely banded, especially towards the tip; its inferior surface is silver-grey, with a few indistinct dusky bars, corresponding with those of the upper surface. The anterior extremities are light grey above, with dusky bars and bands, and silver-white below. The posterior extremities are coloured like the anterior, both above and below.

DIMENSIONS. Length of head, 10 lines; of body, from head to vent, 3 inches 2 lines; of tail, 1 inch 11 lines; of thigh, 11 lines; of leg, 9 lines; of tarsus and toes, 11 lines; total length, 5 inches 11 lines.

HABITS. The *Phrynosoma coronata* is similar in its habit, as I am informed by Mr. Nuttall, to the *Phrynosoma cornuta*. He says its food is invariably insects, and that he has kept them for months in confinement; that they would conceal themselves about his person or about his apartment, but make their appearance at certain times for their food, which they took readily from the hand. When in their wild state they move with great rapidity among the bushes; but when they find they cannot escape by their swiftness, they remain perfectly quiet, and suffer themselves to be made prisoners without resistance.

GEOGRAPHICAL DISTRIBUTION. The *Phrynosoma coronata* inhabits the country south of the Oregon river.

GENERAL REMARKS. This animal was first described by Blainville, from a specimen found in California by Botta; his description is very good, but the figure accompanying it is faulty in many respects, especially in having the superciliary ridge represented with several prominent spines, and in wanting the peculiar serrated margin of the tail. Audubon next gave a good figure of it in his great work on Ornithology, under the name *Agama orbicularis*, from a specimen furnished him by Nuttall.



Phrynosoma Douglassii.

PHRYNOSOMA DOUGLASSII.—*Bell*.

Plate XIV.

CHARACTERS. Head short, triangular, pointed and covered with tubercles, and not spines, on the posterior part, nostrils open at the anterior extremity of the superciliary ridge; body elongated, rounded, flattened, covered above with scales and slightly elevated and pointed tubercles, below with smooth scales; femoral pores, eighteen on each thigh.

SYNONYMES. *Agama Douglassii*, *Bell*, Linn. Trans., vol. xvi. p. 105, tab. x. pl. 105.

Phrynosoma Douglassii, *Wagler*, Natürlich. Syst. der Amphib., p. 146.

Phrynosoma Douglassii, *Wiegmann*, Herp. Mex., pars i. p. 54.

Agama Douglassii, *Harlan*, Med. and Phys. Res., p. 141.

DESCRIPTION. The head is short, triangular, flattened above, with its frontal, vertical, as well as occipital regions covered with closely imbricated polygonal scales; two slightly elevated tubercles only are seen on the latter region. The rostral plate is very small and triangular; the nasal plates are single on each side, very thin, and surrounded by five or six small scales. The nostrils are lateral, situated at the anterior extremity of the superciliary ridge, and are directed upwards and a little outwards. The superciliary ridge projects horizontally over the eye, more so than in any other *Phrynosoma*, and is covered with six large superior orbital plates, and terminates posteriorly in a small tubercle, very slightly pointed. The eye is small, sunken and black; the eyelids are equally movable, and covered with minute scales. There are ten superior labial plates, quadrilateral, and all nearly of the same size; the inferior labial plates are seven in number, quadrilateral, and larger than in any of the genus. Behind these labial

plates, and on the same plane, are four tubercles, slightly flattened and pointed, the posterior largest. The inferior and external border of the lower jaw presents a series of tubercles, those in front smaller and smooth, swelling only a little in the centre, so as to give a festooned appearance; while those under the angle of the mouth are larger, and slightly elevated into a pointed tubercle. Between this series of tubercles and the labial plates, are interposed four or five rows of small scales. The chin is covered with small, smooth, rhomboidal scales, of equal size.

There are nine small tubercles, which surround the posterior and superior part of the head, extending from the point of one meatus of the ear to the other. These tubercles are disposed as in the *Phrynosoma cornuta*, yet are so slightly developed as not to deserve the name of spines, for none of them exceed two lines in length, and the central tubercle is so small as hardly to be distinguished; thus the posterior part of the head loses that spiny appearance so remarkable in the *Phrynosoma cornuta* and *Phrynosoma coronata*. The entrance to the external meatus of the ear is sub-triangular, large above, smaller below.

The neck is short, contracted at the back of the head, and covered above with small scales, and small, slightly elevated pointed trihedral tubercles. The scales of the throat are smooth and very small; the skin presents a transverse fold, which terminates on the side of the neck, over a deep depression in front of the anterior extremities, and here the margins of the fold are furnished with small pointed spines.

The body is short, flattened above, rounded or arched outwards at the flanks, and is protected by small scales, interspersed with trihedral pointed tubercles, less elevated than in the three other species, and arranged in four irregular rows on each side of the vertebral line, and surrounded at their bases by smaller tubercles of similar form. The vertebral line differs here also from the *Phrynosoma cornuta* and *Phrynosoma orbiculare* in having several tubercles interposed in the five or six rows of scales that cover it. The flanks are furnished with only a

single row of spines, that give the serrated margin. The thorax and abdomen are covered with smooth rhomboidal scales.

The tail is broad, thick and flat at its root, but soon becomes small, and terminates in a point; above it is covered with scales and small tubercles, the points of which are slightly elevated; similar points are scattered along the lateral margin of the tail, but by no means form that beautiful serrated edge seen in the *Phrynosoma coronata*.

The abdomen is covered with large, smooth, rhomboidal scales, elongated posteriorly. The vent is transverse, with small scales both before and behind.

The anterior extremities are large, covered above with rhomboidal carinated scales, and with a row of points along the front of the fore-arm; below, the scales are smooth and small; there are five fingers, distinct, and each furnished with a short, delicate, curved nail. The posterior extremities are but slightly larger, and are covered like the anterior, with the exception of a few spines scattered about the thighs and legs. There are eighteen femoral pores, well developed.

COLOUR. The head is brown above, as well as the tubercles; the chin is silver-white, with a few dusky circular spots. The superior surface of the neck and trunk is light grey, with dusky spots and bands, and with a broad vertebral band of yellowish-white; on each side of this vertebral line at the neck is an oblong dark chestnut blotch, reaching to the shoulders; the throat is silver-white. The trunk is marked with dark blotches, placed transversely, but none of them unite at the vertebral line. The thorax and abdomen are silver-white, with minute dusky spots. The tail is coloured like the back, but is more completely banded towards the tip; the inferior surface is silver-grey. The anterior extremities, as well as the posterior, are grey above and silver-white below.

DIMENSIONS. Length of head, 8 lines; of body, from head to vent, 2 inches 8

lines; of tail, beyond the vent, $1\frac{1}{2}$ inches; of thigh, 7 lines; of leg, 7 lines; of tarsus and toes, 7 lines; total length, 4 inches 10 lines.

HABITS. Mr. Bell* says, on the authority of Mr. David Douglas, who observed it in its wild state, that, "like most others of its tribe, it is very nimble during the summer months, and it is then difficult to capture it; but in April, when it first makes its appearance, or in October, before it retires to its winter habitation, being at both seasons weakly, it is easily taken. At such seasons the traveller is constantly annoyed by them during the night, seeking shelter from the cold under his blanket, and is frequently under the necessity of removing these little intruders on his rest. It takes up its abode in the holes made by a species of *Lepus*, *Arctomys*, (*Arctomys Richardsonii*,) which are alternately occupied by them and several species of *Coluber*, which resort there for the purpose of preying on these *Agamæ*, (*Phrynosomæ*,) and on the marmots."

He further states, on the same authority, its food to be coleopterous insects and vegetable substances, as the *Purschia*, *Artemisia*, &c.; but Mr. Nuttall, an accurate naturalist, informs me that he has frequently observed these animals, during a residence of many months in the country about the Oregon river, and that their only food is insects.

GEOGRAPHICAL DISTRIBUTION. The *Phrynosoma Douglassii* is abundant in the sandy plains south of the river Oregon, and chooses for its residence the banks of streams that are covered with the *Purschia tridentata*, *Artemisia*, *Salvia*, &c.

GENERAL REMARKS. Mr. T. Bell gave the first description of this animal in the Transactions of the Linnæan Society of London, and accompanied it with a tolerable figure, in which the short knobs about the head, instead of long spines, as in the other *Phrynosomæ*, are well represented. The individual from which

* Trans. Linn. Soc. Lond., vol. xvi. p. 106.

Mr. Bell took his description and figure was brought from the Oregon or Columbia river by Mr. David Douglas, whose name he has given to the species.

Dumeril and Bibron* have greatly erred in supposing this to be the young of the *Phrynosoma orbicularis*, which they probably inferred from the size of Bell's figure. That it is an adult animal, and perfectly distinct from all others of the genus, I have not the least doubt, as I have seen a specimen, the one from which the accompanying plate was taken, brought alive to Philadelphia from the banks of the Oregon, that equalled in size any *Phrynosoma cornuta* or *orbicularis* that I have ever seen, and yet having no spines about the head.

* Hist. Nat. des Rept., tom. iv. p. 314.

FAMILY. LACERTINIDA. *Dumeril et Bibron.*

CHARACTERS.

1. The head is a quadrangular pyramid, the apex in front, and covered above with polygonal, symmetrical, horny plates.
2. The tympanum is distinct, and though sometimes depressed, is often level with the skin. The eyes have commonly three movable lids.
3. The mouth is extensive, with the labial plates large. The tongue is free, fleshy, flattened, thin, more or less extensible, with its base sometimes lodged in a sheath, and its apex always notched or bifid; above it is covered with scaly-like papillæ, which may be either rounded or angular.
4. The maxillary teeth vary in form and in length, and are implanted on the internal border of a common groove, hollowed on the most prominent portion of the maxillary bones. The palatine teeth are variable, and in some wanting altogether.
5. The body is round, greatly elongated, without a crest, and is protected by scales of variable size. The neck is without a dewlap or sac, though commonly marked with several transverse folds. The abdomen is covered with square or rounded plates, always larger than those on the back.

6. The tail is conical and very long, in some specimens being three or four times the length of the body, and covered with verticillated scales.
7. The extremities are well developed, and are always four in number; the anterior have five fingers, the posterior five toes, all armed with nails.



Ameiva-sex-lineata.

Am. Stomat. L. B. 1861. 20.

F. S. Duerst Lith. 1861.

AMEIVA.—Cuvier.

Genus AMEIVA.—CHARACTERS. Head sub-pyramidal, and covered with plates above; there are palatine and maxillary teeth—of the latter, the anterior are simple, the posterior tricuspid; membrane of the tympanum visible, but depressed below the margin of the meatus; tongue bifid, and covered with rhomboidal, squamiform papillæ; throat with a double fold; body above covered with minute scales; abdomen with smooth quadrilateral plates; the extremities are granulated above, with large scales below; there are femoral pores, and each extremity has four or five distinct fingers or toes, all armed with nails.

AMEIVA SEX-LINEATA.—Linnæus.

Plate XV.

CHARACTERS. Body elongated, dark brown above, marked with six yellow, longitudinal lines; abdomen bluish silver-white; tail cylindrical, very long, and covered with verticillated scales, carinated above, smooth below.

SYNONYMES. *Lacerta sex-lineata*, Linnæus, Syst. Nat., tom. i. p. 364; exclus. syn. Catesby.

Lacerta sex-lineata, Gmelin, Syst. Nat. Lin., tom. iii. p. 1074.

Le Lézard à six raies, Bosc, Nouv. Dict. d'Hist. Nat., tom. xvii. p. 527.

Le Lézard à six raies, Daudin, Hist. Nat. des Rept., tom. iii. p. 183.

Six-lined Lizard, Shaw, Gen. Zool., vol. iii. part i. p. 240.

Lacerta sex-lineata, Harlan, Med. and Phys. Res., p. 144.

Cnemidophorus sex-lineatus, Dumeril et Bibron, Hist. Nat. des Rept., tom. v. p. 131.

Striped Lizard, Vulgo.

DESCRIPTION. The head is rather short, compressed at the sides, and rounded at the snout. The vertical plate is large and pentagonal, broad before, narrow and slightly curved behind; there are two large, irregularly rhomboidal, superior orbital plates, which supply the place of bony orbits; in front of these is a smaller plate, reaching to the frontal: on the outer margin of these latter are two series of small scales, beyond which is a row of seven narrow, elongated plates, that form the external margin of the orbit; the frontal plates are regularly pentagonal, broadest externally; the centro-frontal broad transversely, rounded before, and acute-angled behind; the nasal are quadrilateral, rather elongated, meeting in the mesial line above; the opening for the nostril is in its most inferior part, near the rostral plate, which is triangular, with its basis below and apex above and prolonged. There are five occipital plates, pentagonal, and nearly all of the same size; the two anterior have between them a small triangular plate reaching to the vertical, the three posterior are placed in a transverse row, and are surrounded by small plates, of which there are several series behind. There are three inferior orbital plates, placed nearly in a row—the central is quadrilateral, elongated and narrow: the two others are very small. There is a single loreal plate, pentagonal and large, ascending to the plane of the forehead. The upper jaw is covered at its inferior margin with a row of small, square, labial plates; the anterior only is trigonal and smallest. There are two series of plates to the lower jaw, the inferior largest. The eyes are rather small, with a dusky pupil and a golden iris; the inner margins of the eyelids are bordered with a very narrow band of bright yellow; the membrane of the tympanum is apparent, and of a palish white colour; the entrance to it is round, and of large size.

The body is elongated, and covered on the back and sides with minute scales; the scales of the abdomen are large and arranged in rows, of which those nearest the middle are largest. The tail is very long, perfectly cylindrical, and covered with verticillated scales, carinated above and smooth below. The vent is transverse, and has three large scales, placed in a triangle in front, and with smaller scales behind.

The anterior extremities are well developed, rounded, covered above at the shoulder with a double row of large scales, and with a single row still larger at the fore-arm; their inferior surface is granulated. There are five fingers, distinct, scaled to the root of the nails, which are five in number, short, small, delicate, and curved.

The posterior extremities are twice the size of the anterior; the thigh above is covered with granulations, and below with a row of large scales; the leg is covered like the thigh, but there are two rows of still larger scales; the tarsus is granulated on its inferior surface, and has two rows of scales on its superior. There are five distinct, delicate toes, the fourth very long, each armed with short, small, curved nails; there is a range of femoral pores under the thigh.

COLOUR. The head is dusky brown; the upper jaw bluish-white, the lower nearly of a silver-white colour. Along the back extends, from the occiput to the tail, a purple or brownish band, on each side of which are three yellow or golden longitudinal lines; of these, the superior is the palest and shortest; it begins at the occiput and terminates at the tail; the other lines are much longer and brighter, the upper one beginning above the orbit and extending to the middle of the tail; the lower line begins below the eye, and runs above the tympanum, along the flanks to the anterior part of the thigh; a shorter and more indistinct line extends from the angle of the mouth, below the tympanum, to the shoulder; the spaces between these longitudinal bands are jet black. The throat is silver-white, and the abdomen of a beautiful shining bluish-white colour.

The upper surface of the tail is nearly similar in colour to the back, but appears much rougher from the verticillated scales; its inferior surface is whitish. There are two longitudinal lines on each side of the tail; the superior one is continuous with the central yellow longitudinal line of the back, and terminates about the middle of the tail; the inferior line is paler, it begins back of the thigh, runs nearly to the extremity of the tail, and seems to divide the upper or darker portion from the inferior or whiter part.

The anterior, as well as the posterior extremities, are brownish above and bluish-white below; and along the posterior part of the thigh runs a whitish line, continuous with the inferior longitudinal line of the tail.

DIMENSIONS. Length of head, 7 lines; length of body, 2 inches 8 lines; length of tail, $6\frac{1}{2}$ inches: total length, $9\frac{3}{4}$ inches. They are sometimes seen of greater dimensions.

GEOGRAPHICAL DISTRIBUTION. The *Ameiva sex-lineata* is numerous in the Carolinas, and is found throughout Georgia and the Floridas; how much further west it may exist cannot now be determined.

HABITS. This is a very lively, active animal, choosing dry and sandy places for its residence, and is frequently met with in the neighbourhood of plantations, or near fences and hedges; most usually it is seen on the ground in search of insects; its motions are remarkably quick, and it runs with great speed. The *Ameiva sex-lineata* is very timid; it feeds on insects, and generally seeks its food towards the close of the day, when they may be seen in cornfields far from their usual retreat; and not unfrequently I have met male and female in company.

GENERAL REMARKS. This animal was certainly first described by Linnæus, under the name *Lacerta sex-lineata*, from a specimen sent him by Dr. Garden, of Charleston, who furnished him with numerous rare specimens of plants and animals from Carolina. He observes of it, "Femora postice, ordine papillari ut in *Ameiva*." It is impossible at this time to understand what led him to consider this animal as the Lion Lizard of Catesby, (vol. ii. tab. 68,) with which it agrees neither in colour, habits, nor geographical distribution. The Lion Lizard is of a "uniform grey colour, streaked with lines of a lighter grey;"—"it frequents the rocks on the coasts of Cuba and Hispaniola, and is often the prey of sea-gulls." It is remarkable that most naturalists since Linnæus have copied this error, and given the same reference.

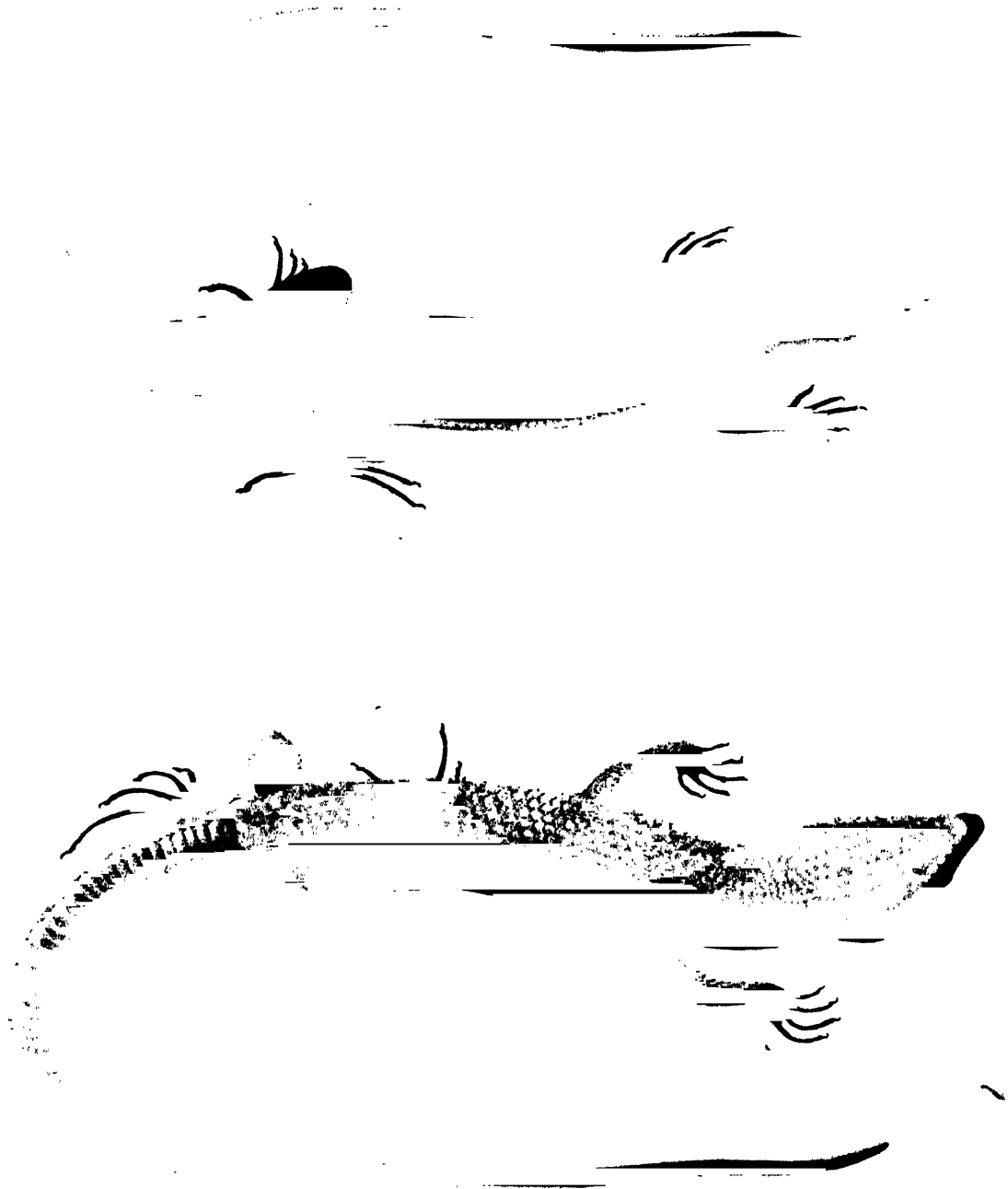
The habits of the *Ameiva sex-lineata* closely approximate it to the true Lizards, of which we have none in the United States, and it may fairly be considered their representative here.

Dumeril and Bibron have arranged this animal in the genus *Cnemidophorus*, (Wagler, Wiegmann,) restricted by themselves so as to differ from that of *Ameiva*, in the tongue being destitute of a sheath at its root into which it can be received. "Les Cnémidophores sont pour ainsi dire des Améiva's à langue non engainante," &c.

FAMILY. SCINCOIDEA.**CHARACTERS.**

1. The head is covered above with large, thin, angular, corneous plates.
2. The jaws are furnished with closely set teeth.
3. The tongue is flat, free, and notched in front; not retractile in a sheath, and is covered entirely or in part by squamiform or filiform papillæ.
4. The neck is of the same size and form as the thorax.
5. The body is cylindrical, without spines, or crest, or lateral groove, and covered with smooth scales, variable in form and size, and disposed in a quincunx.
6. The extremities and tail are covered like the body.

This family includes a great number of genera, differing from each other in the form and disposition of the teeth; in the form and number of the cephalic plates; in the mode of opening of the nostrils, whether in one or more plates; in the presence or absence of eye-lids, whether they are single or not; in the presence or absence of extremities, as to their number, &c. &c. Of this extensive family, only three genera have as yet been observed in the United States—*Plestiodon*, *Scincus* and *Lygosoma*.



Plestiodon erythrocephalus.

Sera pinet

P. R. Durrell, Luth. T. 1901

PLESTIODON.—*Dumeril et Bibron.*

Genus PLESTIODON.—CHARACTERS. Nostrils open in the middle of the nasal plate; palate with a broad mesial fissure, enlarged at its anterior extremity; sphenoidal teeth numerous, short, straight, conical; all the scales smooth.

PLESTIODON ERYTHROCEPHALUS.—*Gilliams.*

Plate XVI.

CHARACTERS. Head large, very broad behind, contracted before the eyes, and covered with plates; snout elongated and rounded; body olivaceous; head bright red; jaws and sphenoid bones armed with strong teeth.

SYNONYMES. *Scincus erythrocephalus*, *Gilliams*, Journ. Acad. Nat. Scien. Philad., vol. i. p. 461, pl. xviii.

Scincus erythrocephalus, *Harlan*, Journ. Acad. Nat. Scien., vol. vi. p. 11.

Scincus Americanus, *Harlan*, Med. and Phys. Res. p. 138.

Plestiodon laticeps, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. v. p. 705.

Scorpion, *Vulgo.*

DESCRIPTION. The head is large, very broad behind, contracted in front of the eyes, but rounded at the snout. The vertical plate is pentagonal, narrow behind, broader, and with an acute angle before. There are five superior orbital plates, irregularly quadrilateral and nearly of the same size, except the posterior, which is triangular and smaller, and may be regarded as a posterior-orbital as it descends a little behind the orbit. The occipital plates are five in number; the two anterior small and rhomboidal; the two posterior quadrilateral and large, with a long, narrow, pentagonal plate between them; behind these are two large, rhomboidal,

elongated scales. The frontal plates are pentagonal; the anterior frontal are smaller and rhomboidal; placed in between the frontal and anterior frontal is a large hexagonal, centro-frontal plate, reaching to a plate behind the nares. The rostral plate is triangular, smaller, and rounded in front and somewhat pointed above. The nasal plate is single, and rhomboidal in shape; between this and the orbital are three loreal plates, the smallest in front, the largest behind. There are three anterior orbital plates, the middle one of which is the largest; and two posterior, the lower being the smaller. The lower margin of the orbit is completed by the sixth and seventh labial plates, of which there are eight; the posterior very large. Between the seventh and eighth labial plates, and the posterior occipital, are three large temporal plates arranged in a triangle, of which the anterior is the smallest.

The nostrils are large, latero-superior near the snout, and open upwards and outwards. The eye is small, the iris dark, the pupil darkest grey. Both eye-lids are covered with small scales. The entrance to the ear is small, elliptico-oval, and surrounded by small scales. The neck is not contracted, but appears so from the great development of the temporal region of the head.

The body is elongated, rounded, and covered with smooth imbricated scales, arranged in longitudinal rows, both above and below, with two or three large scales in front of the vent. The tail is thick at the root, nearly the size of the body, but soon becomes small, cylindrical, and greatly elongated; it is covered with imbricated scales above, like the back; but below there is a central series resembling plates, with scales on either side to about one-third of the distance, when the scales disappear, and the plates are continued, as in some of the serpent tribe.

The anterior extremities, as well as the posterior, are short, thick, and strong; the former terminating in five fingers, the latter in five toes, very delicate, and covered with scales to the root of the nails, all of which are armed with short, small, curved nails.

COLOUR. The head above is bright red. The body and tail above are olive-brown, a little darker on the sides. The throat and abdomen are yellowish-white.

DIMENSIONS. Length of head, 1 inch 2 lines; greatest breadth of head, 1 inch; length of neck and body, 3 inches 2 lines; length of tail, 7 inches: total length, 11 inches 3 lines. I have measured specimens 13 inches in length.

HABITS. The *Plestiodon erythrocephalus* chooses his residence in deep forests, and is commonly found about hollow trees, often at a height of thirty or forty feet from the ground; sometimes taking up his abode in the last year's nest of the woodpecker, out of which he thrusts his bright red head in a threatening manner to those who would disturb his home. He never makes his habitation on or near the ground, and in fact seldom descends from his elevation unless in search of food or water. Though shy and timid, he is very fierce when taken, and bites severely, owing to the great strength of his jaws, as well as the size and firmness of the teeth. The bite, however, though sharp and painful, is not, as is commonly supposed, venomous.

GEOGRAPHICAL DISTRIBUTION. This animal is found from latitude 39° to the Gulf of Mexico in the Atlantic states, as well as in Mississippi and Louisiana.

GENERAL REMARKS. This animal was certainly first described by Gilliams. Lawson, in his *History of Carolina*, speaks of a Lizard called the Scorpion, but he does not mention the red head, which is a distinctive character of this; and Pennant, in the *Supplement to his Arctic Zoology*, has only quoted Lawson.

Temminck and Schlegel,* after the examination of several specimens furnished them by Troost, consider this animal identical with the *Scincus quinquelineatus*, differing in appearance only from age or sex—when a single glance at its compressed snout and broad head at the temporal region, its numerous and strong

* Siebold, *Faun. Japon.* Reptilia, by Temminck and Schlegel, p. 99.

sphenoidal teeth, is enough to distinguish it from all others of our Skinks, without considering its geographical distribution.

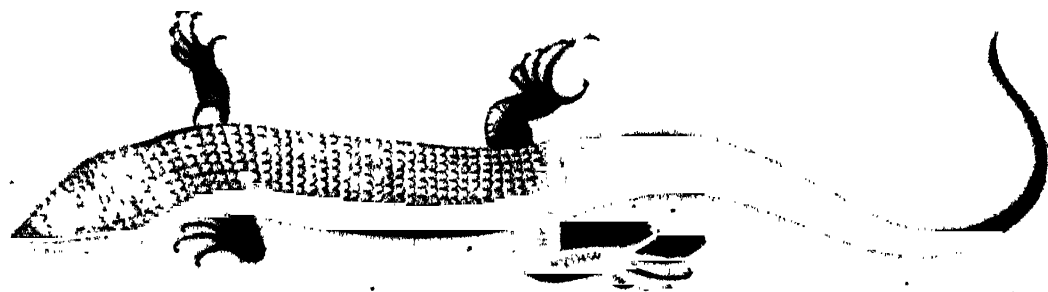
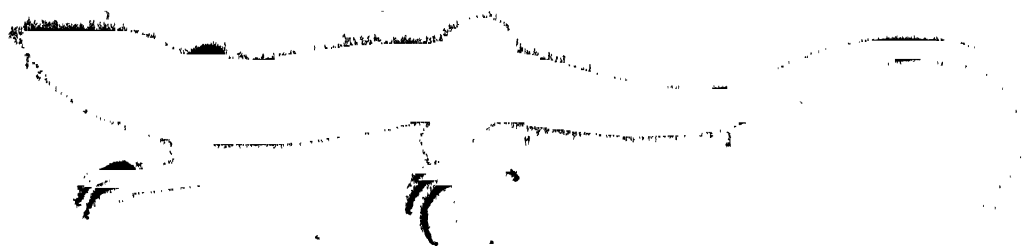
I have adopted, without hesitation, the genus *Plestiodon*, under which Dumeril and Bibron have arranged this animal, which is distinctly separated from that of *Scincus* by the great development of the head at the temporal region, its numerous, strong, conical, sphenoidal teeth, its nostril in a single plate, &c.

I cannot receive their specific name "*laticeps*" for this reptile, because I do not suppose it, with them, to be indentical with the *Scincus laticeps* of Schneider.* His description is too short and vague to distinguish his animal from those closely allied, and he never saw but one specimen in the Museum at Göttingen, in which the "body was of a uniform greyish-brown colour above, and the tail had two black spots near the extremity."

Another animal of the same species, he says, existed in his time in the collection of Tilesius, at Leipsic, "the body of which was shaded with black spots, and had the tail annulated with black bands," (*in cauda vero anulatum apparet*), which is certainly very unlike our animal. Daudin even, who copies Schneider in his description of the *Scincus laticeps*, as there were no specimens of it in the Garden of Plants at Paris when he wrote his excellent work on reptiles, thought best to refer it to the animal represented in Seba,† and said by him to come from Africa.

* Hist. Amphib., Fas. ii. p. 189.

† Thes. tom. ii. tab. xii. fig. 6.



Some plant



Some plant



SCINCUS QUINQUELINEATUS.—*Linnæus*.*Plate XVII.*

CHARACTERS. Head pale red, with six obscure white lines, the two internal confluent at the occiput; body above, olive-brown marked with five pale white longitudinal lines and a black lateral band; tail brown, tinged with blue.

SYNONYMES. *Lacerta quinquelineata*, *Linnæus*, Syst. Nat., vol. i. p. 366.

Lacerta quinquelineata, *Gmelin*, Syst. Nat. Lin., tom. i. pars iii. p. 1075.

Lacerta quinquelineata, *Latreille*, Hist. Nat. Rept., tom. i. p. 248.

Scincus quinquelineatus, *Daudin*, Hist. Nat. des Rept., tom. iv. p. 272.

Scincus tristatus, *Daudin*, MSS. from Bosc, Hist. Nat. des Rept., tom. iv. p. 296.

Scincus quinquelineatus, *Schneider*, Hist. Amphib., fas. ii. p. 201.

Lacerta quinquelineata, *Shaw*, Gen. Zool., vol. iii. p. 241.

Lacerta tristata, *Bosc*, Nouv. Dict. d'Hist. Nat., tom. xvii. p. 524, pl. xv. fig. 2.

Scincus quinquelineatus, *Merrem*, Versuch eines Syst. der Amphib., p. 71.

Euprepis quinquelineatus, *Wagler*, Natürlich. Syst. der Amphib., p. 162.

Scincus bicolor, *Harlan*, Journ. Acad. Nat. Scien. Philad., vol. iv. p. 286, pl. xviii. fig. 1.

Scincus quinquelineatus, *Harlan*, Med. and Phys. Res., p. 138.

Plestiodon quinquelineatus, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. v. p. 707.

DESCRIPTION. The head is large, somewhat triangular, broad behind, though much less so than the *Scincus erythrocephalus*, with the snout elongated, narrow and rounded. The vertical plate is elongated, hexagonal, broad in front, narrow behind; there are five occipital plates, arranged in two rows; the anterior row has two plates, pentagonal, and broadest internally; the posterior row has three, the middle one of which is greatly elongated, pentagonal, larger and angled in front—the lateral are larger and nearly quadrilateral, with their anterior and

internal angles truncate, which gives them a slight pentagonal appearance; behind these are several large scales. There are four large irregularly quadrilateral superior orbital plates and three posterior orbitals, the lower one larger, besides some small plates interposed between them and the eyelids, which are also covered with minute scales; there are four anterior orbital plates, one of which is large, and the superior makes a part of the superciliary ridge; the inferior wall of the orbit is sustained by the sixth and seventh superior labial plates. The frontal are pentagonal, a little rounded, and broadest transversely; the centro-frontal is broad and hexagonal, and the anterior frontal are small, round and oblong. The rostral plate is triangular, with its apex upwards, and its basis rounded and directed downwards. The nasal plates are single on each side, small, and nearly circular in shape. There are three loreal plates between the nasal and orbital—the two posterior are large and irregularly quadrilateral, the anterior is small and triangular. The margin of the upper jaw is covered with eight quadrilateral labial plates, the posterior of which is largest above, and behind these are temporal scales. The two posterior labial plates are by no means as much developed as in the last animal. The nostrils are near the snout, lateral, but open upwards and outwards. The eyes are small, the pupil dark and the iris grey. The opening of the external ear is large and oval, longest vertically.

The body is elongated, cylindrical, and covered with sub-rhomboidal scales, so rounded and imbricated as to appear semicircular; these scales are arranged in longitudinal and oblique rows. The throat and abdomen are covered with rhomboidal scales, imbricated and rounded posteriorly like those of the back. The vent is transverse, with two large and two small scales in front, and small scales behind.

The anterior extremities are short and covered with scales, similar to those on the back, and terminate in five distinct slender figures, covered with scales, and each furnished with a small, delicate, curved nail. The posterior extremities are large, and covered with scales like the anterior, and terminate in five long, slender toes, each with a short and curved nail.

The tail is cylindrical and very long, and covered above with hexagonal scales, a little rounded posteriorly; below, it is covered with five rows of similar scales, and all of the same size, for one-third its length, when their place is supplied by a single row of larger plates, like the sub-caudal plates of the Boa.

COLOUR. The head is pale red above to the tip of the snout, and marked with six obscure white lines, two are above each eye and one below. These lines are only remarkable in the young animal; in the very old they become nearly obsolete.

The body is olive-brown, and marked with five light coloured lines, more or less distinct; the vertebral line is very dingy white, frequently not evident; it is formed by the junction of the two superior lines of the head, extends to about one-third of the tail, and includes about one-third of two adjoining scales. On each side of this is another line, more distinct, continuous with that above the orbit, and extended to nearly the same distance; this line either takes up a whole scale, or it runs through its centre. Below the latter is still another line, continuous with that beneath the orbit, and is most distinct of all; it is interrupted at the external meatus, but again recommences behind it, and is extended above the shoulder, along the flanks, and terminates on the tail; this also includes one scale, or it passes longitudinally through its centre. Between these two latter lines is a broad dark coloured lateral band.

The throat and abdomen are white.

The tail is coloured like the body above, but the lines are less distinct, and terminate about half its length, when the whole becomes dusky, with a tinge of blue.

The anterior and posterior extremities are of the same colour as the back above, and are silver-white below, with a short white line on the posterior face of the thigh.

DIMENSIONS. Length of head of the animal here described, $7\frac{1}{2}$ lines; length of body from head to vent, 2 inches 3 lines; length of tail beyond the vent, 4 inches 4 lines; length of thigh, 4 lines; of leg, 4 lines; of tarsus and toes, 6 lines: total length, 7 inches 2 lines. They reach a much greater size, and are frequently seen 10, and even 11 inches long.

HABITS. The *Scincus quinquelineatus* lives on insects, and is found in our forests, choosing for its residence holes in the stumps of old and decaying trees, or such as have fallen to the earth. Although it climbs readily enough, it is almost always found on the ground, and I have never yet seen its abode at any great elevation.

GEOGRAPHICAL DISTRIBUTION. The *Scincus quinquelineatus* is found in the Atlantic states, according to Dr. Pickering, from lat. 35° to the Gulf of Mexico; its western range cannot now be determined. I have only received it from Mississippi and Louisiana.

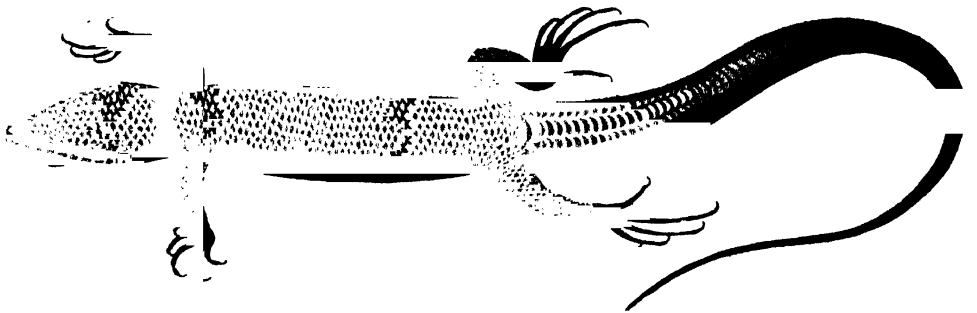
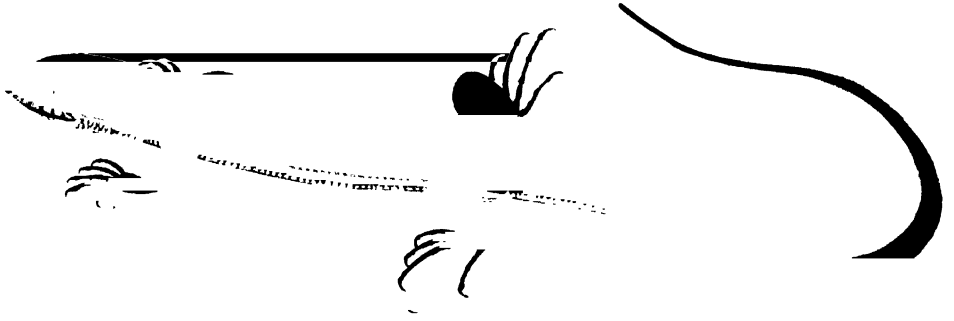
GENERAL REMARKS. Linnæus gave the first account of this animal in the twelfth edition of the *Systema Naturæ*, from an individual sent him by Dr. Garden, of Charleston. The description is on the whole good, but was evidently taken from a specimen preserved in alcohol, which had changed the red colour of the head, as no mention is made of it.

Latreille and Daudin, though they describe this animal under the specific name of "*quinquelineatus*," again reproduce it under that of "*tristatus*;" the former arranging it among the Lizards, the latter more properly with the Skinks; both, however, describe it from specimens sent them by Bosc. That these specimens were preserved in alcohol is evident, as no notice is taken of the reddish-coloured head; and that they were adult animals is equally certain, as no mention is made of the lines about the head, or of the vertebral line, which frequently all become nearly obsolete in old age. The *Scincus tristatus* of Daudin cannot be meant for the *Scincus fasciatus*, for in that the six lines about the head always exist; nor

for the *Plestiodon erythrocephalus*, as his description of the plates under the tail might lead one to suppose, for in the latter animal the head is always red, and the longitudinal lines along the body are always wanting.

There can be little doubt that Garden himself, who had the best opportunity of examining, believed this animal to be different from the Blue-tailed Lizard of Catesby, or he would never have sent it to Linnæus as a new species.

After all, the specific name of “*quinclineatus*” is not so well chosen as it appears at first view, for others of the same family have the same number of lines, and disposed nearly in a similar manner.



Scincus fasciatus.

J H Richard del.

F S D'Arval, Lith Phila.

SCINCUS FASCIATUS.—*Linnæus*.*Plate XVIII.*

CHARACTERS. Head above bluish-black, marked with six straw-coloured lines, the two superior unite at the occiput; body above bluish-black, with five straw-coloured longitudinal lines; tail rich ultra-marine blue.

SYNONYMES. Blue-tailed lizard, *Catesby*, Carol., vol. ii. p. 67, pl. lxvii.

Lacerta fasciata, *Linnæus*, Syst. Nat., ed. x., vol. i. p. 209.

Lacerta fasciata, *Linnæus*, Syst. Nat., ed. xii., p. 369.

Blue-tailed lizard, *Pennant*, Arc. Zool., vol. ii. p. 334.

Lacerta fasciata, *Gmelin*, Syst. Nat. Lin., vol. i. p. 1075.

Scincus quinquelineatus, *Schneider*, Hist. Amph., fas. ii. p. 202, *variety*.

Scincus quinquelineatus, *Daudin*, Hist. Nat. des Rept., tom. iv. p. 272, *variety* i. p. 275.

Lacerta fasciata, *Shaw*, Gen. Zool., vol. iii. p. 241.

Euprepis fasciatus, *Wagler*, Natürlich. Syst. der Amphib., p. 162.

Plestiodon quinquelineatus, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. v. p. 707.

Scincus quinquelineatus, *Harlan*, Med. and Phys. Res., p. 138.

Blue-tailed Lizard, *Vulgo*.

DESCRIPTION. The head is short, broad behind, with the snout a little pointed and rounded. The vertical plate is hexagonal, broader before, narrow behind. There are five occipital plates; the two anterior are quadrilateral and smaller; and of the three posterior, the central is elongated, narrow and rhomboidal, broad and angled in front, narrow and rounded behind; back of the occipital are large scales, and on the sides temporal plates. There are four large superior orbital plates, of which the two central are largest; there are three small posterior orbital, and four larger anterior orbital plates; while the inferior wall of the orbit

is sustained by the sixth and seventh superior labial plates. The frontal are irregularly quadrilateral, with their internal angles elongated; the centro-frontal is hexagonal, broadest transversely; and the anterior frontal are sub-quadrilateral and rounded in front. The rostral plate is large, pentagonal, hollowed below and angled above. The nasal are rounded and single on each side.

The nostrils are very near the snout, and lateral, but opening upwards and outwards. There are eight quadrilateral superior labial plates, sixth and seventh largest. The eyes are rather small, the pupil dark, the iris golden, the eye-lids dark brown, with an internal narrow yellow margin. The external meatus of the ear is oval and vertical, the tympanum pale flesh colour.

The body is elongated, cylindrical, and covered above with small rhomboidal scales, imbricated, and arranged in longitudinal rows.

The throat and abdomen are covered with scales approaching the hexagonal form, but are so rounded posteriorly and so imbricated as to appear semicircular.

The tail is cylindrical, very long, and covered above with scales, larger than those on the back; below there is a central row of large plates, resembling those of the Boa. These plates begin about one inch behind the vent, between which and their commencement are three rows of imbricated scales; while in the *Scincus quinquelineatus* there are five rows of scales, which extend to half the length of the tail. The vent is transverse, with two large and two smaller scales in front.

The anterior extremities are short, and covered with scales nearly hexagonal, but with their external angle rounded; there are five fingers, distinct, and each furnished with a small delicate and curved nail. The posterior extremities are well developed, covered with scales similar to the anterior; there are five long slender toes, each with a short curved nail.

COLOUR. The head and body above are beautiful bluish-black; the upper jaw is dusky, and the lower jaw bluish-white. A straw-coloured or yellowish-white line begins near each nostril, and unite at the occiput into a longitudinal vertebral line, which becomes pale blue as it passes the posterior extremities, and finally terminates about the anterior third of the tail; this line includes the half of two contiguous scales, and has regular margins. Above and in front of the orbit of the eye, begins another line of the same colour, or a little more yellow; it takes the same course, assumes the same blue colour when it has passed the posterior extremities, and terminates nearly at the same distance on the tail. Beneath this latter line is placed still another, which begins below and in front of the orbit, is interrupted at the external meatus, again recommences behind it, and is continued over the shoulder along the flanks to the end of the tail; these two lines include the upper half of one row of scales, and have their inferior borders only straight. Between these yellowish-white lines the scales of the back are so imbricated as to appear braided, like a whip-cord.

The throat and abdomen are white.

The anterior third of the tail is coloured like the back, but lighter, and the five lines are of delicate pale blue; beyond this the colour of the tail is the richest ultra-marine blue above, and a little paler below.

The anterior extremities are brownish above and silver-white below, with a yellowish-white longitudinal line along the posterior face of the shoulder and forearm. The posterior extremities are coloured like the anterior, and have a similar longitudinal line on their posterior surface; but this only extends the length of the thigh.

DIMENSIONS. Length of head, $7\frac{1}{2}$ lines; length of body, from head to vent, 2 inches 5 lines; length of tail beyond the vent, 5 inches; length of femur, 6 lines; of leg, 6 lines; of tarsus and toes, 9 lines: total length, $8\frac{1}{2}$ inches.

HABITS. The *Scincus fasciatus* is found in shady places, principally in forests of oak, and frequently under the bark of decaying trees. It feeds on various species of insects, and is very lively and rapid in its motions; and as it climbs with facility, is not easily taken alive. It very seldom, however, takes to trees, unless to escape its pursuers; but, like the *Scincus quinquelineatus*, is almost always found on the ground, or on the trunks of fallen trees, which it chooses for its basking place.

GEOGRAPHICAL DISTRIBUTION. This animal is found in several of the Atlantic states; Haldeman has observed it in Pennsylvania; Dr. Geddings in Maryland; I have seen it in the Carolinas, and I have received specimens from Virginia and from Georgia near Florida: nor is the *Scincus fasciatus* confined to the Atlantic states, for Dr. Pickering observed it in Ohio, and Dr. Pitcher in the state of Michigan.

GENERAL REMARKS. It is not a little singular that this animal should have been so frequently confounded with the *Scincus quinquelineatus*, when they are so entirely distinct, as may readily be seen by a reference to the accompanying plates. Catesby first described the *Scincus fasciatus*, and gave a tolerable plate of it, under the name Blue-tailed Lizard, in his *History of Carolina*, &c. Linnæus next received it in the tenth edition of his *Systema Naturæ*, under the name *Lacerta fasciata*; nor can there be any doubt of his meaning, for his first reference is to Catesby's "*lacerta cauda cerulea*," his second to Pettiver,* which reference must go for little, as no one can positively determine at this time what animal Pettiver had in view. The same description and the same references are continued in his twelfth and last edition; although here for the first time appears, as a new species, the *Lacerta* (*Scincus*) *quinquelineata* sent him by Garden. Gmelin also, in his edition of the *Systema Naturæ*, received very properly the *Scincus fasciatus* and *Scincus quinquelineatus* as different species.

* *Gaz. Nat. et Art.*, pl. i., fig. 1.

Schneider appears to have been the first to consider these two animals as nearly identical; for, in describing the *Scincus quinquelineatus*, he says: "*Forte Linnæi fasciata lacerta Carolinensis hinc non multum abludit;*" and in this he has been followed by most Naturalists, as Latreille, Daudin, Dumeril and Bibron, &c., with the exception of Shaw.

That they are distinct animals, I believe; for,

1. Their whole colour is different. In the *Scincus quinquelineatus* the head is pale red; the body olive, tinged with green, with a broad, black, lateral band; the tail dusky; while in the *Scincus fasciatus* the head and body are bluish-black; the six lines about the head and five of the body are constant, and the tail always a beautiful ultra-marine blue: nor is this colour the result of injury, as some have supposed, for the colour is the more brilliant the younger the animal, as I have seen in hundreds of instances.

2. And besides there is a difference of disposition of the plates and scales under the tail in the two animals, as above described.

3. The geographical distribution of animals would, if it were properly known, go far in determining the identity of species; thus the *Scincus quinquelineatus* is a southern animal, and has never yet been found, as far as I know, north of Virginia, though abundant in the Carolinas, Georgia, and the more southern and western states, ascending high up the valley of the Mississippi; while the *Scincus fasciatus* inhabits the Atlantic states from Maine to Florida; but I am not aware that it exists west of the Mississippi.

Nor am I yet prepared to believe with Temminck and Schlegel, that our *Scincus quinquelineatus* is identical with a Japanese animal, though there may be a great resemblance between them. Similar animals are frequently found within similar parallels of latitude, or, it might rather be said, where the temperature is nearly the same. Thus, in France and Germany are found the Common Toad, *Bufo*

vulgaris, the *Rana esculenta*, the *Rana temporaria*, all of which are beautifully represented in the northern parts of the United States by the *Bufo Americanus*, the *Rana helecina*, and the *Rana sylvatica*; while in South Carolina many of the animals of Egypt (nearly in the same parallel) are represented by many closely allied species—the Crocodile by the Alligator, the *Trionyx Ægyptiacus* by the *Trionyx ferox*, &c. &c. Yet none of these animals are identical.

I cannot place this and the preceding animal as Dumeril and Bibron have done in their genus *Plestiodon*, because they lack the sphenoidal teeth, which is one of its strongest characters; and though the nostril really opens in a single plate, it is not in its middle, but so near its upper part, and the superior margin is so thin that the plate appears almost crescentic.



Cryptobranchus alleganiensis

LYGOSOMA.—Gray.

Genus **LYGOSOMA**.—**CHARACTERS.** Nostrils open in a single plate; anterior frontal plates wanting; palate without teeth, and with a superficial triangular notch near its posterior margin; scales of the body smooth.

LYGOSOMA LATERALIS.—Say.

Plate XIX.

CHARACTERS. Head short; snout rather full; tail very long; body, as well as extremities and tail, above bronze, or at times chestnut coloured; throat silver-white; abdomen yellow; tail, beneath bluish, mottled with grey; a broad, black, lateral band from the head to near the extremity of the tail.

SYNONYMES. *Scincus lateralis*, Say, in Long's Exped. to Rock. Moun., vol. ii. p. 324.

Scincus unicolor, Harlan, Journ. Acad. Nat. Scien., vol. v. p. 156.

Scincus lateralis, Harlan, Med. and Phys. Res., p. 139.

Lygosoma lateralis, Dumeril et Bibron, Hist. Nat. des Rept., tom. v. p. 719.

Ground Lizard, *Vulgo*.

DESCRIPTION. The head is short, and resembles a four-sided pyramid of nearly equal faces, truncated at its apex so as to make the snout rounded. The vertical plate is elongated-pentagonal, terminating in a point behind; there are four superior orbital plates, large, of irregular form, and bordered externally with a series of minute plates; the frontal are irregularly pentagonal, longest transversely,

and touch each other only by an acute angle in front of the vertical plate; the centro-frontal is also irregularly pentagonal, most extensive in the transverse direction, and with its two posterior articulating facets slightly incurvated for the frontal plates; the nasal plate is single and quadrilateral; the rostral is sub-triangular, straight below and rounded above. There are three anterior orbital plates, quadrilateral, the superior largest, and between these and the nasal are two small, irregularly-quadrilateral loreal plates. The occipital plates are five in number, all nearly of the same size; the two anterior are triangular, and reach near to the vertex; the middle one has nearly the same form, and the external are oblong.

The nostrils are small, lateral, and open upwards and outwards in the midst of a single nasal plate; the eyes are small, the pupil is black, and the iris is of dusky-grey and very small.

The tympanum is apparent, the entrance large, with its anterior margin destitute of projecting scales: two or three rows of very wide scales usually follow the occipital plates.

The body is elongated, cylindrical, and nearly of the same size throughout, and covered, both above and below, with small, smooth, rhomboidal scales, most extensive transversely, imbricated, and disposed in thirty longitudinal rows. The vent is transverse, with large scales in front, and smaller ones behind; of the former, the two central are largest. The tail is round, exceedingly long, stout, and only diminishes in size suddenly near the tip, and is covered with scales similar to those of the body.

The anterior extremities are small and short; the fingers are five in number, each furnished with a minute and curved nail; the posterior extremities are rounded; the toes five in number, each with a nail; the inferior surface of the fingers is serrated, from the projecting points of the scales or tubercles; the soles of the feet are also studded with small tubercles of equal size.

COLOUR. The whole superior surface of the head, body and tail, is a beautiful chestnut; the inferior surface is silver-white at the throat, yellow at the abdomen, and this colour extends for a short distance beyond the vent; the lower surface of the tail is blue, with a tinge of grey. In the female, the yellow of the abdomen is but slight, being little more than white with a yellowish tinge. A remarkable lateral line of jet black begins at the snout, runs through the eye, over the tympanum and shoulder, along the sides of the body and over the posterior extremities to beyond the middle of the tail; below this line the sides of the body are dark grey. The superior surface of the extremities is darker chestnut than the back; the inferior surface is light brown.

DIMENSIONS. Length of head, $4\frac{1}{2}$ lines; length of body to vent, 1 inch 3 lines; of tail, 3 inches 2 lines: total length, $4\frac{1}{2}$ inches.

GEOGRAPHICAL DISTRIBUTION. The range of the *Lygosoma lateralis* begins certainly in North Carolina, whence I have received specimens; it extends south as far as the Gulf of Mexico, and is continued westward to the Mississippi river. Dr. Blanding has observed this animal at Camden, S. C.; Leconte in Georgia and Florida; Say, on the Missouri, and how much farther west it may exist, cannot now be determined.

HABITS. The *Lygosoma lateralis* may be seen by thousands in the thick forests of oak and hickory in Carolina and Georgia; they emerge from their retreats after sunset, in search of small insects and worms, on which they live; yet their motions are so quick, they appear and disappear so rapidly, that they might at first be mistaken for crickets or other insects. Though so numerous, it is difficult to secure them alive; for when approached, they conceal themselves with astonishing quickness under the roots of old and decaying trees, or beneath fallen leaves, or other vegetable substances; this decaying vegetable matter sometimes forms a stratum several inches thick, containing numerous holes and crevices, to which they can easily retreat, when they are pursued by their enemies.

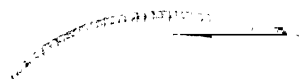
GENERAL REMARKS. This animal was first described by Say, in Long's expedition to the Rocky Mountains.

Though delighting in dark and shady forests, I have never yet observed the *Lygosoma lateralis* to ascend trees, either in search of food, or in its attempts to escape when pursued.

FAMILY. CHALCIDA.**CHARACTERS.**

1. The head is rather small, and is covered with polygonal plates.
2. The teeth are not implanted in the maxillary bones, but are applied to their inner surface.
3. The tongue is broad, free, notched in front, covered with squamiform or filiform papillæ, and though slightly extensible, is not retractile in a sheath.
4. The body is generally cylindrical, elongated or serpentiform, and has most commonly a deep groove along the flanks, produced by a fold of the skin.
5. The body and tail are covered with verticillated plates or scales.
6. The extremities are but slightly developed, or are entirely wanting.

Only one genus of this family is found in the United States—*Ophisaurus*.



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Ophisaurus ventralis.

J. Quoy, del.

P. a. Duvall, Lith.

OPHISAURUS.—*Daudin. Dumeril et Bibron.*

Genus OPHISAURUS.—CHARACTERS. Head sub-oval; craneal plates very numerous; nostrils lateral; nasal plate single; eye-lids two, of unequal size; tongue arrow-shaped, notched in front, free in its anterior third, covered before with granular, and behind with filiform papillæ; palatine teeth in several rows; intermaxillary teeth conical; maxillary, sub-cylindrical and simple; body serpentiform, with a deep longitudinal groove on each side; extremities wanting.

OPHISAURUS VENTRALIS.—*Linnæus.*

Plate XX.

CHARACTERS. Head sub-oval; snout rather long; body elongated, cylindrical, with a deep groove on each flank; body and tail with lines of black, green and yellow, each scale being marked with these three colours; abdomen yellow; under surface of tail dirty yellow, upper surface like the back.

SYNONYMES. Glass snake, *Catesby*, Carol., &c., vol. ii. p. 59, pl. lix.

Anguis ventralis, *Linnæus*, Syst. Nat., tom. i. p. 391.

Le Jaune et Brun, *Lacépède*, Quad. Ovip., tom. ii. p. 447.

Anguis ventralis, *Gmelin*, Syst. Nat. Lin., tom. i. pars iii. p. 1122.

Chamæsauro ventralis, *Schneider*, Hist. Amphib., tom. ii. p. 215, 342.

Anguis ventralis, *Latreille*, Hist. Nat. Rept., tom. iv. p. 223.

Ophisaurus ventralis, *Daudin*, Hist. Nat. des Rept., tom. vii. p. 352.

Hyalinus ventralis, *Merrem*, Versuch eines Syst. der Amphib., p. 79.

Ophisaurus ventralis, *Cuvier*, Reg. An., tom. ii. p. 69.

Ophisaurus punctatus, et *striatulus*, *Cuvier*, loc. cit., p. 70.

Ophisaurus ventralis, *Wagler*, Natürlich. Syst. der Amphib., p. 159.

Ophisaurus ventralis, *Harlan*, Med. and Phys. Res., p. 111.

Ophisaurus ventralis, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. v. p. 423.

Glass Snake, *Vulgo*.

DESCRIPTION. The head is sub-oval, elongated, with the snout slightly projecting and rounded, and is covered above with numerous small polygonal plates. The vertical plate is large, elongated, irregularly pentagonal, broader behind, pointed before and surrounded by many smaller plates. There are six large polygonal superior orbital on the outer side, which make an external, slightly projecting superciliary ridge, and this line of plates is continued even to the rostral plate. The frontal is large, irregularly rhomboidal, and surrounded by six smaller plates. There are seven small inferior orbital plates, with many small scales above them, and two small anterior orbital, between which and the nasal are eight or ten small, polygonal, loral plates disposed in three rows. The nasal plate is single and rhomboidal; the rostral is sub-triangular, rounded above and projecting in front. The upper jaw is covered with nine pentagonal, large, labial plates. The nasal plate is simple, small, and quadrilateral. There are eleven superior labial plates on each side, the anterior of which is narrow, rhomboidal, and elevated to touch the plate, separating the rostral and nasal. The third, fourth, fifth, sixth, and sometimes the seventh are pentagonal and smaller; the eighth, ninth, and tenth are largest of all, and most extensive in the longitudinal direction; the eleventh is smallest. There are sixteen inferior labial plates, that of the chin largest.

The nostrils are lateral and near the snout, but open upwards and backwards.

The eyes are rather small, the pupil is black and the iris grey. The opening to the external ear is small, oval, and placed behind the angle of the mouth.

The neck is not contracted, but is of the same size as the head and thorax.

The body is elongated, serpentiform, sub-cylindrical and deeply impressed with a lateral groove, very visible during respiration. Above it is covered with rhomboidal, closely imbricated, but perfectly smooth scales, disposed in longitudinal and transverse rows, sixteen of the former and about one hundred and twenty of the latter between the neck and tail.

The abdomen is protected with larger plates of hexagonal form, broadest transversely, and arranged in longitudinal and transverse series, ten of the first and one hundred and twenty of the second.

The tail is very long, more than twice the length of the body, although about the same size at its root; it is perfectly round and tapers very gradually to its tip, and is covered with scales similar to those of the body, verticillated so as to make when entire about one hundred and forty rings.

COLOUR. The head above and at the sides is mottled black and green, tinged with yellow at the jaws. The body and tail above are marked with longitudinal and transverse lines of black, green and yellow, corresponding with the position of the scales. The under surface of the whole animal is bright yellow, most remarkable at the abdomen. Several varieties of colour have been observed in this animal by foreign herpetologists, which to me seems to be the effect of the liquor in which the specimen may have been preserved, or of long exposure; for, during life, I have never observed the colours other than those represented in the accompanying plate, varying only in brightness, and I have seen thousands.

DIMENSIONS. Length of head, 1 inch 2 lines; length of body to vent, 9 inches; length of tail, 18 inches 3 lines: total length, 28 inches 4 lines. I have examined specimens more than 3 feet 4 inches in length.

HABITS. The *Ophisaurus ventralis* chooses dry places for its abode, and passes much of its time in holes, or under the roots of old trees, and is often dug out of the earth with the sweet potato (*Convolvulus batatas*) at harvest time. When

alarmed, it moves with considerable swiftness, and is not easily taken without injury, for the vertebræ of its long tail are articulated like those of a Skink, and are easily separated by a slight blow; indeed it is from this extreme fragility of the tail that the animal has received the common name of Glass Snake.

GEOGRAPHICAL DISTRIBUTION. The Glass Snake is found on the Atlantic border, from southern Virginia to Cape Florida. It inhabits Alabama, Mississippi, and Louisiana, and is found in many of the States bordering on the Mississippi, Missouri and Ohio rivers. Its extreme northern range, west of the Alleghanies, seems at this time to be Michigan.

GENERAL REMARKS. Catesby was the first naturalist who described the Glass Snake, and gave a tolerable figure of it, though defective in colour. Linnæus received it in the twelfth edition of the *Systema Naturæ* as the *Anguis ventralis*, which specific name has been generally adopted by succeeding naturalists. Schneider separated it from the genus *Anguis*, and placed it in his *Chamæsauros*. Daudin made for it a new genus, which he named *Ophisaurus*, and very properly, for the Glass Snake has really the external form of a serpent, with the internal organization of a saurian animal.

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